

HAND-BOOK

OF



New Mexico

AND

DURANGO, COLO.

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HAND-BOOK

—AND—

TRAVELERS' GUIDE

⇒OF⇒

NEW MEXICO,

—BY—

A. AVERY,

—FOR—

**TOURISTS, MINERS, CAPITALISTS AND
EMIGRANTS.**

DENVER, COLO.:
E. PRICE & Co., PRINTERS.
1881.



INTRODUCTORY.

This book is written by one who has long been a resident of both New Mexico and Colorado, and consequently knows on what points information is wanted by the most of people, in regard to the "New West." He has endeavored to meet this want by devoting a part of the work to a description of the "Life and Customs" of its present Mexican population, of 100,000 inhabitants. The balance of the space is occupied by information in regard to the agricultural, mineral and other resources, to be used by millions of American population to come!

HAND-BOOK OF NEW MEXICO.

NEW MEXICO is as large in area as New York, Pennsylvania and New Jersey with room enough left in the corner to tuck away all the New England States, without crowding. Its mineral resources are not as well developed as those of California or Colorado, but what is known of it is rich in copper, iron, silver and gold. On these, as well as agricultural points, much more will be said further on.

It has one hundred and twenty thousand square miles, or twenty-seven million acres of territory. The whole country is an upland, crossed by mountain ridges, which enclose small valleys.

Its principal river is the Rio Grande, noted for its fertile valley, giving to the country its famous grape-growing district in the southern part of the State, while the central and northern part of the valley are equally reliable for their crops of corn, wheat and other products of a temperate zone.

Fifty other rivers, besides numerous small streams, carry the snows of its mountains to the sea. Some of them, on their way, washing the gold from the gravel in the sluice box of the miner, or watering the growing crop of the farmer, at the same time depositing a rich sediment from the mountain front, which keeps the ground in a constant state of fertility.

The general height of the mountain range on either side of the Rio Grande and Pecos is between 6,000 and 8,000 feet, while they occasionally reach 10,000 and 12,000 feet above the sea level. One of the highest mountains is Mount Taylor, northwest of

Santa Fe, with an altitude of 15,000 feet above sea level, or 10,000 feet above the neighboring valley of the Rio Grande.

The climate is varied, from the difference in the latitudes and elevations of the different parts of the country, but is everywhere free from malaria. The dryness of the atmosphere also makes it very healthy for persons who would otherwise be consumptive.

Some idea of its dryness may be gained from the fact that it is not necessary to salt meat in order to preserve it, but merely to hang it up exposed to the air.

This same dryness of the air is the occasion of the puzzling state of affairs to one who is accustomed to the parts of the United States other than the Rocky Mountain belt. If he visits this country at any other time than spring or early summer, he will find the dried grasses (uninjured by rain or even heavy dew) yielding food for large herds of sheep and cattle.

HISTORY.

New Mexico was ceded to the United States in 1848, and organized under territorial government in 1850. Its name was given it over 300 years ago by the Spaniards, from its mineral deposits being similar to those of old Mexico. New Mexico, as well as old Mexico and Arizona, has an antiquity of rare interest, for, although its history has been imperfectly written, it is known to have been inhabited by an industrious and cultured people.

About the 10th century the Toltees peopled the country. They are supposed to have come from the north. They were driven out of the country by the Aztecs in the year 1200.

They were also from the north, and ruled the country until the conquest by Cortez in 1519. They were much more brutal than the Toltees, and fearfully subject to a religion requiring a sacrifice of human beings, several thousands annually being offered on the altars of their gods.

In the year 1537 an expedition from Florida made an overland trip to New Mexico. Three years later another expedition from old Mexico visited the same country, both of them from the same motive, love for the mineral treasures, reported to be within its borders. At this time different missions were established at Santa Fe and at other places in New Mexico.

The Spaniards continued to hold the country until 1680. During this time they had opened mines and enslaved the Aztec population to work them. Some of those mines had yielded immensely, one of them is said to have paid \$10,000,000 to the church. But at last, owing to the cruelties of the Spaniards, the Indians revolted in 1680. This was the great rebellion. The Spaniards and priests were driven from the country, and the mines and churches destroyed.

The Indians re-established their religion and government, but in 1692 the country was again conquered by the Spanish, who held it for 150 years. During this time several unsuccessful insurrections were inaugurated.

While the war was in progress between Mexico and the United States, Santa Fe was captured by the United States troops under Gen. Kearney. He built Fort Marcy, the ruins of which can still be found in Santa Fe.

TOWNS.

Of the towns of New Mexico, the first in age, size and historical interest is Santa Fe, a town that was old and steady when that other old city of America, Quebec, was welcoming its first inhabitant. A town that was old when St. Augustine was young, and how many centuries before that its birth-day was, no one knows. It is situated on one side of a valley, near lofty mountains, and looks, as every other Mexican town, like a large and prosperous brick yard, where an indefinite number of brick kilns await their turn at burning.

The buildings are generally of adobe, and, as Santa Fe houses are like most other Mexican houses, a description here will do for the rest.

An adobe is a sun-dried brick, generally made nine inches wide, eighteen inches long and four thick. They are generally mixed with short straw to hold them together. Of these adobes, as we would pronounce the word, the walls of the houses are made, a mortar of the same material being used. When the height for the roof is reached, straight poles are laid in position as near as possible to one another, with a slight incline from one wall to its parallel wall. On these poles a coating of stiff mud is spread, and over that loose earth. A mud floor nicely leveled off, a small door, a window or two, and a fire-place in the corner, complete the house.

Both the outside and inside of the walls are plastered with mud, and generally whitened with Plaster of Paris. I never saw a Mexican use lime under any circumstances, but the women whiten their walls, and for the dances their faces, with Plaster of Paris. A Mexican fire-place is a success. It is built high and narrow, very shallow, and with a Gothic-shaped top. It is smoothly plastered inside and out, and never smokes. The houses of the more wealthy are an arrangement of rooms similar to those described, around a central court-yard.

While the poorer people who can afford but a one-room house, will have that next to a neighbor, all through the country detached houses are the exception. One of the most interesting buildings in Santa Fe is the Governor's palace. It occupies one side of the plaza. It has but one story in height, but it has a history. It was erected before the year 1580, and we give Gov. Arny's description of it:

"This interesting old building, on account of the repairs repeatedly made upon it now-a-days, is fast losing its antique appearance and internal arrangements. It has been the scene and witness of many events of interest and importance, the

recital of many of which would to us of to-day seem almost absolutely incredible. In it lived and ruled the Spanish captain general, so remote and inaccessible from the viceroyalty at Mexico that he was in effect a king, nominally accountable to the viceroy, but practically beyond his reach and control, and wholly irresponsible directly to the people. Equally independent for the same reason were the Mexican governors. Here met all the provincial, territorial, departmental and other legislative bodies that have ever assembled in the capital of New Mexico. Here have been planned all the domestic Indian wars and measures for defence against foreign invasion, including as the most noteworthy the Navajo war in 1823 and the Texan invasion in 1842, the 'American of 1846 and the Confederate of 1862.' Within its walls was imprisoned in 1809 the American explorer, Zebulon M. Pike, and innumerable state prisoners before and since; and many a sentence of death has been pronounced therein and the accused forthwith led away and shot at the dictum of the man at the "palace." It has been from time immemorial the government house with all its branches annexed. It was such on the fourth of July, 1776, when the American congress at Independence Hall in Philadelphia proclaimed liberty throughout all the land, not then, but now embracing it. Indeed, this old edifice has a history. And as the history of Santa Fe is the history of New Mexico, so is the history of the palace the history of Santa Fe."

Santa Fe has many more interesting buildings, and there are plenty of interesting traditions for those who care to investigate them. This city has also been long famous for its Mexican filigree jewelry. There are at present two establishments making it. They have on exhibition numerous specimens of their work, some of them of very fine workmanship, and made from native gold.

In business there is much more done than would be supposed by the stranger. There are several very large concerns at this

point with heavy stocks of goods. In pre-railroad days, much time was consumed by the trains in making their trips from the Missouri River to Santa Fe, and very often the value of goods in transit far exceeded those in store. Occasionally a train was captured by Indians on the plains. All this had to be paid for by somebody. The writer of this has paid thirty cents per pound for nails, and for other things a proportionate price. I suppose this tariff has helped the merchant out. At any rate, they are not at all poor. But, now that the railroads have equalized things, extreme prices are a thing of the past. Santa Fe has about 3,000 inhabitants.

ALBUQUERQUE.

This town is the rival of Santa Fe in its struggle for commercial supremacy. It is the centre of a large sheep country, and also the headquarters of the fruit growing of the lower Rio Grande valley. It has a railroad connection, and probably will have more. Coal has been found near it, also copper in large quantities, but from a perusal of the articles in regard to grape growing and mining in other parts of this Pamphlet, the important relation of this town to those industries will be better understood. It is situated on the Rio Grande River.

LAS VEGAS.

This city has been, by the advent of the railroad, converted into two towns. The older town is similar to all other Mexican towns, with its central plaza, and its principal stores and public buildings surrounding it. The new town is just across a narrow stream. It is composed of frame houses. Both of the towns transact a large business with parties fitting out for White Oaks and other mining points. It also has a large local trade with the owners of cattle and sheep.

WHITE OAKS.

This new mining town is situated in the southwestern part of Lincoln County. It is creating great excitement from the mineral discoveries made in its immediate vicinity. It is about 160 miles from Santa Fe, but can be reached from Las Vegas to good advantage. The district is well supplied with timber and water. The mineral formation in this district is porphyry, limestone, sandstone and iron. It is noted for its ore carrying free gold. From one of its mines specimens are taken of rock with "wire gold" yielding \$19,000 to the ton. Hundreds of locations are made, and, as is usual in all new mining camps, a steady increase of population is going on. It also has silver leads and rich placer diggings. It has several paying mines, and, with a present population of several hundred, it seems destined to become a large place.

SILVER CITY.

It is situated in Grant County, in the southwestern part of the Territory. It has a population of 2,000. It is the centre of a mining district, and has a prosperous business. Some of the mines in its vicinity are well developed, and give the assurance of a steady growth to the city. The ore is a chloride of silver. The silver is also found in the shape of sulphurets, and in other combinations. The Santa Rita and other copper mines are worked in its vicinity. They are rich, and profitably worked. The ore is a red copper.

TAOS.

Is a quaint old town in the upper part of the Taos Valley. It is surrounded by a good agricultural country, and has a large flouring mill built on the American plan. There are good min-

eral lands in its vicinity. It contains the grave of Kit Carson, and the ruins of an old cathedral that was built by the Spanish priests previous to the great rebellion. Here can also be seen a collection of houses built and occupied by the Pueblo Indians. These Indians and their customs are described elsewhere.

It was near this town that the writer saw some entirely original machinery for making molasses. The stalks of the Mexican corn had been cut into small pieces. A hollow log had been placed upright and filled with the pieces of stalk. Over this a long stick had been arranged as a lever to press the juice from the stalks. On the stick was a row of Mexican humanity acting as weights. The always present cigarette was there, and they smoked contentedly while the corn juice trickled from the rude press. The aged Mexican was perched on that pole. He was pretty well dried up and didn't count much for weight. Next him sat a bouncing girl that did count for weight. The face shawl which they always wear was folded as usual to show nothing but the eyes. Those eyes are always black, and look out at you with a timid roguishness which speaks volumes, for their eyes are large. The rest of the sitting room was occupied by anybody that would weigh. But time was no object to any of them, and they might as well sit there and smoke, as to sit in the sun by the walls of the houses as they generally do.

MORO.

Is an old Mexican town, surrounded by well cultivated land on the Moro River. It has its church and school, and is inhabited by many of the better class of families.

ESPINOLA.

This is a new town, about twenty miles north of Santa Fe. It is the terminus of the Rio Grande Railroad in that direction. It has a population of about 600, and is building up very rapidly.

MINING.

Mining in New Mexico, as well as Colorado, is to be the industry which will give it the greatness of an empire. This business is regarded by many as no legitimate one at all, but as something in which it might do for a rich man to invest a moderate sum of his surplus capital, with a lively probability of his losing it. You will hear, too, the old remark often repeated, that "There has been more money spent in holes in the ground than was ever taken out." A few people stop to figure it out, but a good many more accept it as correct, without investigation. Some because they have no practical experience in the business and do not know what the proportion of the time is that is spent in prospecting, to the time employed in productive work. A good many more accept it as true, because they are in the habit of following other people's lead in such things.

This remark is not true in the first place, and, even if it were, the steady production, night and day, of producing mines, would soon more than offset the time spent in prospecting. Another thing which throws a cloud over the business is the loss which has been sustained by many from the absurd investments they have made. Some men who have made money at the east in the most laborious way; who have learned who to trust in credits; how to take advantage of the market, and who are justly looked upon as models of commercial shrewdness, will come here and buy a hole in the ground, or shares in some mining scheme that is worthless, or next to it, if the matter is presented by some smooth talker. If these same parties would take more time to acquaint themselves with the mining business before investing, they would be able to bring the same shrewdness which they had always displayed in their eastern business to bear in their new field of operations. On the other hand, when capital is embarked in mining under the right management, I know of no business which would equal it in returns.

The producer of silver has the world for a market. As he does not fear breaking down the prices of his production, he can give his whole attention to the economical working of his property, with the certainty that his business will not be affected by panics or other interruptions that prostrate what some people call regular business. The mineral wealth of New Mexico consists of deposits of iron, copper, silver and gold ore.

GOLD MINING.

Gold is known to exist in over fifty different localities. The best known of these places is the Cimaron district. This is a section of country lying between the Taos Valley and Maxwell's ranch, and thirty miles west of the latter place. Gold was discovered here in 1867. Large quantities of gulch gold have been taken from these mines. This has come from the decomposition of rich gold bearing quartz veins lying in the mountains east and west of the localities containing the gulch gold. Some of these quartz veins are worked, and many more are supposed to exist which have contributed their share of the gulch gold.

Another gold field is the placer district south of Santa Fe. From the placers at least \$1,000,000 have been taken. Stamp mills are also in use in this section, with profitable results. A great many productive veins are in this locality, as many as twenty shafts having been sunk upon one mountain alone.

Gold bearing quartz is also found in the Sandia Mountain, and in the range east of the Rio Grande for one hundred miles south of Santa Fe and northward for 120 miles.

Gold has been discovered at Arroyo Hondo, Taos County. At Pinos Altos quartz gold mining has received considerable attention. A great many lodes have been discovered paying from \$40 to \$200 per ton.

Gold in quartz and fine placer gold has been found on the head-waters of the Rio de Las Animas, and placer gold on nearly

all the streams tributary to the San Juan River; also on the Chama River. Gold placer mining was quite successful before the war, near Fort Stanton, Lincoln County. At the San Jose mines, in the Sierra Madre Mountains, gold quartz was extensively mined by the Spaniards, and afterwards by the Mexicans. The quartz veins here intersect each other in all directions.

The White Oaks district is one of the newest sensations in gold mining in New Mexico. For a description of its mineral see the article on the town of White Oaks.

SILVER MINING.

One of the most promising points devoted to this industry is Silver City. This is the county seat of Grant County. The silver is found in the shape of chloride, and also sulphuret ore. This district is a very rich one, and one of the most extensively developed of any in New Mexico. The Georgetown and Hillsboro' districts, northeast of Silver City, are producing mineral in paying quantities, owing to the development of those sections, which have been pushed during the past few years.

Gov. Arny gives the following description of a curious silver mine in the Silver City district: "It is called the Two Ikes, and is an immense bed of slate, with horizontal layers, the seams filled with silver of the class called horn." Other prominent points for silver mining are the placer mountains near Santa Fe, the Ute Creek Mountains near Maxwell's, the Organ Mountains near the Mesilla Valley, the Arroyo Hondo mining region in Taos County, the San Juan Mountains, especially, at the headwaters of Rio Dolores and Rio La Plata, which are west, on the Ute Indian reservation. Vast deposits of Smithsonite are found at this point. The Organ Mountains are extremely rich in silver. Over fifty mines have been discovered, the ore being generally argentiferous galena, admitting of simple reduction by smelting, the mines paying from \$40 to \$200 per ton.

Just over the New Mexico line, in Chihuahua, are the mines of corralitos. These are the most successful mines in that country. They have been mined for nearly fifty years, and have annually employed several hundred hands.

Brevort gives the following interesting account of an old silver mine and its re-opening:

"Near the old town of El Paso, tradition places the locality of one of the richest silver mines of those formerly known to the Spaniards. Its site had been lost since the expulsion of the Jesuits, until last year. It is said that the Jesuits of Northern Mexico were the last to suffer the decree of expulsion, and had sufficient notice of the edict and carefully covered up the traces of the mining there. In this way the localities of many of the richest mines of New Mexico have been lost.

"As the section in which this remarkable old mine is situated is a portion of the mineral bearing mountain system of New Mexico, we will here give a condensed account of the mine and its history.

"The locality and history of the mine called the Mina del Padre having been gathered from the old church records at El Paso, several gentlemen there determined to re-open it, which they did in the winter of 1872-3. The year 1680 was the year the mine was discovered, by the monks of the Order of Saint Francis in charge of the church at El Paso. The same year the Spaniards under Governor and Chaplain General Obermin, were all expelled from New Mexico by the Pueblo Indians.

"Skilled in the science of mineralogy, they were not slow to discover the extraordinary richness of the Padre vein, and their knowledge of the art of metallurgy enabled them to work it very profitable for many years.

"From the silver obtained from this mine most of the churches in northern Chihuahua were enriched and endowed. The Jesuits were never friendly to the Franciscans and when, in the early part of the eighteenth century, the order of Jesuits

obtained complete control in Spain, it was not long ere the barefooted Franciscans were ordered to depart from Mexico and surrender their rich possessions to the dominant Jesuits. When information of the coming change reached the monks at El Paso they quietly covered the mine and obliterated as near as possible all traces of its existence.

"Years passed on. The Jesuits, if they had learned the secret of the silver treasure, never availed themselves of it. In 1792 the mine was again opened and worked for several years by a company of Mexican gentlemen. The works for the reduction of the ore were situated near the river banks of the Rio del Norte or Rio Grande. The revolution of 1810, followed by the declaration and establishment of Mexican independence, again interrupted the working of the mine, and it was a second time filled up and abandoned, and so remained until the late re-discovery and re-opening. This was done at considerable trouble and expense.

"A shaft was sunk ninety feet through the material which had been used to fill up the mine, and which, from lapse of time, had become almost as firmly cemented together as the original soil. Although the main load is not yet reached, the ores that have been taken out during the progress of the excavation prove to be immensely rich.

"Soon after it was opened, a gentleman arrived upon the ground who had come from California expressly to search for this very mine, having obtained there some clue to its value and locality. He was not aware that similar data had been obtained at El Paso, and he was just in time to be too late. The mine is situated at the southern point of the Organ Mountains, here about 1,500 feet high, two and a half miles from the city of El Paso, and is a lode or vein of black chloride of silver, containing sulphurets, the out-cropping about forty feet wide. The silver lode lays in a bed of old red sandstone, and the overlying face rock is igneous, with traces of iron in it."

SAN SIMON DISTRICT, GRANT COUNTY.

Respecting this district, Capt. O. R. Smythe, in a recent letter to the Sedalia Democrat, says:

"A new and wonderful discovery has been made in Grant County, New Mexico, on the slope of the Stein's Peak range of mountains, near the Arizona line, about eighteen miles on a direct line west from the noted mining camp of Shakespeare, and thirty-five miles by the stage road. The discovery is a mountain of silver-bearing carbonates, exceeding in richness 'Little Pittsburgh' at Leadville, or any other mines discovered—with a splendid climate, mean average temperature of sixty degrees.

"This new camp has been named the 'San Simon District.' The formation of the country is granite and porphyry. The mineral deposit is found in the foot hills and lower mountains of the Stein's Peak range. The highest hill or mountain, and the one on which the largest and richest deposit of mineral has yet been discovered, has an elevation of from 1,500 to 2,000 feet above the valley and 4,400 above the level of the sea.

"The stratifications of the country rock are well defined and can be plainly seen from the valley below. This property is an extensive one, and runs horizontally with the mountains, the mineral leads cutting them at right angles. The surface earth is gravel and loam and underneath that is the sandstone capping. The work so far shows this capping to be from one to four feet thick, and immediately under it the mineral is found. The wall rock of these leads is granite and porphyry. The leads, so far as developed, are of great width.

"The 'Des Moines' Mine shows mineral from ten to twenty feet wide. The 'Iowa' Mine, which is an extension, but on the opposite slope of the mountain, is a well-defined lead, showing mineral upwards of fifty feet wide. The metal is a gray and brown carbonate, assaying from 60 to 165 ounces in silver."

COPPER.

A new discovery of this metal has been made about fifty-five miles southwest of Las Vegas, also west of the city near Aqua Sarca some indications are looking well. There are also beds of copper ore in the placer mountain district which will yield a handsome profit after allowing \$50 per ton for freighting expenses. Copper ores are found in the Cimmaron district, in Turkey Mountain, north of Ft. Union, on the Sandia Mountains adjoining the Rio Grande, along the whole extent of the Organ range, and in abundance in the placer mountains south of Santa Fe. One of the many good veins in this locality is twenty feet thick, and reported to contain from 15 to 26 per cent. in copper and also to be rich in gold. On the San Ysidore Mountain in this district there are numerous lodes of copper, as well as silver and gold, which were worked many years ago, before the memory of the oldest inhabitant. The ruins of numerous furnaces and arastas are to be seen.

On a rich vein recently opened in Tijeras Canon, on the Sandia Mountains, one mile from the town of Tijeras, a shaft has been sunk 200 feet, the vein being three feet thick and improving as the mine deepens; a large quantity of good ore has been taken out, and a smelting furnace erected close by.

Twenty years ago two copper mines, the Santa Rita and the Hanover, were extensively worked, turning out about twelve tons of copper per week, and employing several hundred hands. They are situated on the spurs of the Sierra Madre known as the copper mountains. There are many other veins in this locality, one of which has been traced eight miles, and at one point is 125 feet in width. The Santa Rita is the oldest copper mine in the mountains, having been worked at different times for 130 years.

This copper district is surrounded by every facility for successful working, there being plenty of water and timber, while

to the south the plains present as fine a pasturage as there is in the United States, and at a convenient distance are large and fertile valleys which can furnish supplies of food for the operatives. This ore is of a peculiar richness, averaging 35 per cent. copper, while the metal is often found pure. The veins are wide, and the ore loose and easily mined. There is no alloy, and the reduction of the ore is a simple smelt.

Copper is also found on the San Francisco River, in Reloncillos range of mountains, at the Nacimiento, in the San Juan, Utah country. At this place mining is carried on by the Nacimiento Mining Company, which has ore yielding from 63 to 71 per cent. These mines are at the head-waters of the Puerco River, near Abiquien.

Mr. C. P. Clever gives the following description of the Hanover Copper Mine: "To reach this region from Mesilla by way of Ft. Cummings, the road past the Miembres River, Hot Springs and Santa Rita, is about one hundred and ten miles, but it is only ninety miles from Ft. Craig to the Hanover Mines, by a direct southwest route practicable for wagons. The Hanover Mines are situated about 6,350 feet above the ocean, where a syenitic granite, having large hexagonal crystals of mica, has elevated the carboniferous limestone two hundred feet up the west flank of the mountain; but the openings, of which there are many, are near the first appearance of the aqueous rock, in the narrow valley, in which also the furnace is erected. The granitic range has a strike west of north, and, bringing the limestone up in that direction, gives it on the west flank a west of south dip. This axis is crossed by a highly ferruginous rock, sometimes a pure magnetic iron ore, tending apparently rather in dike from east of north, and forming frequently in places with the adjacent aqueous rock, for a considerable distance, immense masses of breccia.

"Near these disturbing forces a sixty-three foot shaft has been sunk, and various tunnels run, exposing extensive deposits

of copper, often green or blue carbonate, sometimes native copper in the decomposing feldspar of the granite, occasionally (especially at the openings down the valley from the furnace) as vitreous copper, sometimes as grey copper. An analysis of this malachite, or green carbonate of copper, has been forwarded by Mr. Cox since the above was written.

"The result was, oxide of copper, $72.64=58$ per cent. of metallic copper. The ore occurs ramifying sometimes for fifty or sixty feet in width through the decomposing feldspar, forms therein rich deposits, and extends vertically below any point yet reached. In some places where the iron ore described above intersects, it forms the gangue, but is easily detached mechanically. The smelting, from all that we saw and could learn from Mr. Pinkle, the former proprietor, now involves much less labor and expense than is common in Europe.

"This gentleman had studied metallurgy in his native country, Saxony, and had erected extensive works, which were paying well, when he was driven off by the Indians, and compelled, by his extensive losses, to sell out most of his interest in said mines. Much of the machinery remains there, and the furnaces are standing.

"He ran the mixed ores first through high narrow furnaces, and completed the work in those of a reverberatory form, running the metal into iron moulds.

"In Germany it was not unusual, some years since, to roast for many months, and then to submit the copper to at least five distinct smeltings; a labor rendered unnecessary at these mines in consequence of the purity of the ore. The copper thus shipped to the States has commanded, ever since it was tried, a ready market at a price equal to that of the best Russia copper. It is said to be a trifle harder than that of Santa Rita, hence more suitable for nails, bolt heads and similar work in sheathing vessels. This is probably due to a slight admixture of iron, not eliminated in the imperfect mode of smelting, adopted until better

machinery was obtained. The necessary materials had been purchased, and the improvements were in process of construction, when the Indian troubles commenced. On the hills and mountains around the Hanover furnace there is abundant timber for charcoal and fuel; pines, pinon, some walnuts and a good deal of oak. The sandstone, already mentioned, is in places suitable for furnace hearthstones; the syenitic, when porphyritic, we observed to be very durable, especially that of a grey color, at least as far as we could judge from the weathering, and the limestone, remote from the locality in which its condition was, as already described, highly metamorphosed, will readily burn into lime."

Since the above was written, a new company has taken hold of the property and are working it with profitable results.

IRON.

The deposits of iron ore are numerous, extending from the Raton Mountains to the Placer and Sandia Mountains, overlooking the Rio Grande. It is found of excellent quality near Las Vegas, where are two veins, one of magnetic oxide, four feet thick, and very rich, and the other of specular iron ore, also rich, and six feet in thickness.

At the Placer Mountains, south of Santa Fe, there are three veins, six to ten feet thick, of rich magnetic iron ore. There are other deposits of iron ore on Maxwell's grant, in the Apache Hills, north of Fort Union, and near Jemez.

Many of these deposits being quite near to coal and limestone, their value is greatly enhanced for manufacturing purposes. Such is the case in the Raton Mountains, at the Placer Mountains, and with those at Maxwell's.

At the Placer Mountains south of Santa Fe there is sufficient timber within a radius of ten miles from the Tuerto ore to smelt a half million of tons, even if the coal should not answer. At

the Hanover Copper Mine there is an inexhaustible supply of iron ore, partly magnetic, partly a red hematite, apparently in a continuous ridge trending towards a reported iron mountain, about fifteen miles distant.

I have, when riding horseback a short distance from Santa Fe, rode over a mountain of iron, where, at every step of my horse, the sound from the contact of the iron ore with his shoe would be as clear as that given by the contact of two pieces of iron.

COAL.

Is found in many different parts of the Territory. Fifty miles northeast of Fort Union there are veins of bituminous coal extending for a range of sixty miles, one of which, on Vermijo Canon, is ten feet in thickness, and has been examined for a distance of ten square miles.

Deposits of coal are known to extend as far west as the Moqui villages, more than 300 miles from Albuquerque, where Dr. Newberry saw a bed twelve feet thick. Anthracite coal is found in the Placer Mountains near Santa Fe, bituminous coal on the west side of the Rio Grande, near Albuquerque, and very extensive coal beds further south, on that river near Ft. Craig.

In the Sarcina Canon, about thirty miles west of the Rio Grande, are three distinct seams of coal, averaging three to four feet in thickness. One of these is four feet thick, and apparently without any included slate veins. It dips about 40 degrees, and the quality is not very good at the outcrop, but it may improve at greater depth.

The extent of the deposit remains to be proven, but as we hear of coal existing north, south and west of this locality, at intervals over long distances. There is a reasonable prospect of finding an abundance of fair coal.

Dr. Parry found, near Acoma, sixty miles from the Rio Grande, west from Albuquerque, cannel coal in veins as thick

as twenty inches, which the Indians use for jet ornaments, and very good coal at San Jose, seven miles west of Cuberro, in three veins, of which the total thickness was three feet—the thickest seam being twenty inches.

Near Gavilan Pass, twenty miles from the town of El Rito, is found a good vein of coal of workable thickness; also near San Pedro, on the divide between the Puerco and the Jemez, is a vein of fine cannel coal, two feet thick, and nearly everywhere indications of an abundance of cannel coal. Good coal is found immediately west of the Sierra Madre, near Fort Defiance, and is reported to extend to within a few miles of Campbell's Pass. We quote the following from Brevoort's excellent work:

"The occurrence of anthracite coal in workable beds in the western territories, near the gold and silver mining districts, is of such importance that a reference to the anthracite coal beds between the Old Placer Mountains and the Cerrillos in Santa Fe County, occurring as they do in connection with carbonate of iron and hematite, and having numerous veins of rich magnetic iron ore within a few miles of them, cannot fail to command the attention of the intelligent reader. The outcroppings of coal in the district referred to were first exposed in the centre of the little branches that run into the Galisteo. The first one is about four miles south of the Galisteo. The following section of the strata was taken ascending:

"1. Laminated clay, with thin seams of sand passing up into carbonaceous clay as a floor for coal.

"2. Anthracite, 5 to 6 feet.

"3. Drab clay, indurated, 15 to 29 feet.

"4. Ferruginous sandstone, passing up into a light grayish sandstone 30 to 50 feet.

"The mine is opened by a tunnel 90 feet in length; the dip is 15 degrees to the east: this coal contains 88 per cent. of fixed carbon. In another locality the coal is opened by three tunnels,

two twenty-five feet long, and one forty feet long, and has a thickness of four feet of anthracite. The coal from this mine contains 87 per cent. of fixed carbon, and when burning shows only the short, blue flame of carbonic oxide. This coal has been in use in driving the engine of the New Mexico Mining Company's stamp mill in the vicinity. A hundred pounds brought to Santa Fe was used by Professor Bruckner in his assaying furnace, in order to test the heating power practically. He found that a white heat was reached in a very short time, and that this heat lasted about three times as long as that produced by an equal weight of charcoal. As the material does not coke in the least, it is evident from this test that it is perfectly adapted to use in blast furnaces, though it will require a higher pressure of blast on account of its density, than charcoal or coke. As far as its application for all practical purposes is concerned, it is undoubtedly fully equal to Pennsylvania anthracite, and really the best fuel discovered so far in the West.

"Between these two mines exists a bed of excellent fire-clay. It has been thoroughly tested, and proved to be fully adapted as fire-proof material for furnaces.

"Coal banks have been opened at a number of points to the north of the above mines, and the proof is conclusive that it exists in large quantities. Between the clay and the following sandstone stratum, beds of iron ore are found. Both carbonate and hematite are present. Ores of this kind, as well as veins of magnetic iron of great purity, abound in this vicinity.

"The existence of mines of gold and silver, of lead, zinc, copper and antimony, and of the different ores of iron, in almost immediate connection with deposits of anthracite coal, and fire-proof material, indicates at once the valleys of the Galisteo and Santa Fe, as points which have all the natural requirements to guarantee the erection upon a large scale of metallurgical works and machine shops for railroads, etc. Other coal beds have been found in the county of Santa Fe, mainly upon the Santa Fe,

the Tesuque, and the Galisteo streams. In the Tijeras Canon, in Bernalillo County, a mile and a half above the town of Tijeras, a vein of bituminous coal four and a half feet thick, was seen and traced by sinking shafts along the vein for a distance of two thousand feet, by the engineer of the railroad survey.

"In the Pecos Valley coal has been found in various localities, and also in the Gallinas Valley, in San Miguel County. There is a fine bed of it five miles above the town of Anton Chico, on the Pecos, and another on the eastern slope of the Chupaines Mountain, near the town of Las Vegas, on the Gallinas.

"In the Cimarron section a large vein of coal, fourteen feet thick, is reported on Rabbit Ear Creek, four miles below the wagon road ford.

"Accessible to the Rio Grande Valley, from the mouth of the Galisteo southward to El Paso, a large amount of coal is found. The following are the localities reported, of which those on the Puerco, in Tijeras Canon, and near Don Pedro, are the only ones that have been actually examined.

"1st. Near San Felipe, thickness and quality reported good.

"2d. Six miles east of Algodones, reported very good.

"3d. In Tijeras Canon, already referred to, $4\frac{1}{2}$ feet thick, quality at outcrop not very good; expected to improve when opened.

"4th. West of Los Lunas on the Puerco, of fair quality—has been used in government shops.

"5th. Near La Joya, on east side of river.

"6th. In the Sierra Magdalena, west of Socorro.

"7th. North of Fort Craig, 8 miles east of Don Pedro, vein $5\frac{1}{2}$ feet thick. Dr. Leconte, geologist, examined this bed, and reports it of good quality, and that it may be worked for many years.

"8th. In the Caballo Mountains, on east side, below Craig.

"9th. At Robledo.

"10th. Abundantly near Dona Ana and Mesilla, on both sides of Rio Grande, 3 feet thick of good bituminous coal.

"In reference to the proposed railroad branch from Albuquerque to El Paso and Chihuahua, these deposits along the Rio Grande assume great importance. They will furnish a large traffic to the road, besides enabling it to be operated cheaply. They are also invaluable to the mines of silver, gold, copper, lead and iron, which line both sides of the Rio Grande almost continuously, enabling these ores to be cheaply produced and smelted; and they will furnish fuel to the large agricultural population which will before long fill up this unwooded valley.

"Coal and iron are generally associated, that is to say, the widely spread ores of iron are generally found in connection with workable coal beds, and their value depends much upon this connection. Recent extended examinations show that the largest and most valuable of the recent coal deposits are connected with the tertiary strata, such being the formation in which the thick beds of carbonaceous deposits are met with along the eastern slope of the Rocky Mountains, extending from the vicinity of Long's Peak, to the western tributaries of the Arkansas in Colorado, and the Cimarron, the Canadian and the Pecos in New Mexico. But besides these well determined beds, so conveniently located for railroad purposes, we meet with other deposits in the valley of the Rio Grande, the Puerco of the west, the San Jose and Ojo Pescado, showing an extension of the coal deposits fully two hundred miles west of the Rio Grande. The precise character of these deposits is not yet fully determined; most of the beds here exposed consist of thin irregular seams, widening out at points to a workable thickness, and at other times associated with igneous protrusions that have converted them into anthracite. The most promising of these beds are those connected with the Puerco coal basin; they present a succession of beds from two to five feet in thickness, generally steeply inclined and associated with shales and sandstones, contain-

ing frequent bands of iron ore. To determine satisfactorily the precise character and actual value of these deposits would require detailed examinations and extensive excavations, which can be more advantageously effected in the process of railroad construction. In the meantime the large extent of country over which these deposits are found, warrants a reasonable expectation, that when thoroughly examined, the coal product of this section will be ample to meet the requirements of railroad fuel, and also afford freighting material for transportation to destitute districts."

SALT.

On the great plateau of the Rocky Mountains, southwest of Canon Blanco summit, are the Salinas, which furnish an unlimited quantity of good salt. A large part of New Mexico is supplied from here, it being wagoned to Santa Fe, Las Vegas, to the towns along the Rio Grande, and even to Chihuahua. The only cost is that of transportation. It occurs in quantity in many places in New Mexico, often mixed with alkali, and also pure in lakes. One vein is in the neighborhood of Fort Stanton. The evaporation in the salt lakes makes an annual deposit of salt several inches in thickness; coarse, strong and of the best quality. It has often been taken to the city of Chihuahua for sale, as the salt of that State is inferior, being mixed with alkali.

The principal lakes are in the valley between the Organ and the Sacramento Mountains, one lake on the Texas line and the best one sixty miles northward, and another large and excellent one about sixty miles south of Santa Fe, near the town of Manzano, whence many wagon loads are regularly carried to Santa Fe and other distant points, the article forming quite a commodity of interior commerce.

These salt lakes have been used as public property, owing to the custom of the country.

GYPSUM.

Is very abundant in many parts of the Territory. The Mexicans use it for plaster, for window lights, &c. It is found near the Sandia Mountains, where, at the towns Tejon and Una de Gato, quite a business is carried on by the people, who make plaster and sell it at Santa Fe and along the Rio Grande for \$1 per bushel. It may be expected to furnish a considerable local business. Near Tejon there is a bed of gypsum, crystalline and opaque, three miles long, three hundred yards wide, and ten feet deep. On Tecolote Creek it is equally abundant.

SALTPETRE.

Is common, but is rarely found pure. At one place, near the international boundary line, it is found pure near a spring, where extensive deposits are made upon the clay, whence it is gathered in considerable quantities, mainly by Mexicans from the city of Chihuahua, the locality being just within the Mexican territory.

The State Government of Chihuahua regulates by law its collection, and in like manner attempts the prohibition of its exportation.

PLUMBAGO.

Has been found in New Mexico in many localities

ZINC.

Is found in the Sierra Madre, in the Sandia Mountains and in the San Juan country.

QUICKSILVER.

Virgin and Cinibar is found in the Rio Grande country, below the Taos Mountain Pass. Old Spanish records mention the Mogollon Mountain as the place where Cinibar is found.

MINERAL SPRINGS.

And hot springs are very abundant in New Mexico. The principal springs are found near Las Vegas, in San Miguel County; near Don Fernandez, in Taos County; at Ojo Caliente, in Rio Arriba County; near Jemez, in Santa Ana County; near Fort McRae, in Socorro County, and Fort Selden, in Dona Ana County, and at Mimbres, in Grant County.

The hot springs at Las Vegas are very well known. They are six miles from town. A large hotel accommodates visitors. The water is beneficial in cases of rheumatism, spinal diseases, dyspepsia, &c.

JEMEZ SPRINGS.

Sixty miles from Santa Fe, in Bernalillo County, are well worth a visit. The waters have the same properties.

The Ojo Caliente springs, of Rio Arriba County, about 50 miles from Santa Fe, are also quite noted. It is within a few hundred yards of the old Mexican town of Ojo Caliente, to the east. At this point several military companies have been stationed for operations against the Indians.

GRAPE GROWING.

Is extensively carried on in the vicinity of Albuquerque. In the valley of the Rio Grande the soil is sandy, but rich. It is watered by the process of irrigation, which of course gives the

grape grower perfect command of the crop, as far as moisture is concerned, and as the vine is free from many of the diseases which are so injurious in other countries, splendid crops are the result.

The vine is generally cultivated to grow to the height of four or five feet. The grape is of an amber color, has a thin skin, and a very nice flavor. For many years the grapes of this vicinity have been carried, on the backs of donkeys, to markets two hundred miles away, and there can be no doubt but what, with the advent of railroads, they will be carried 2,000, or more. The grape growing district extends from El Paso northward to the latitude of Santa Fe.

The native wine produced from these grapes is a very popular one among those who have tested it. It is exported from the Territory for sale in the States, and will in time become widely sought after by the wine-drinking world.

It is of this wine that the United States Surveyor-General for New Mexico, in his Annual Report for 1869, says: "Yearly new vineyards are coming into bearing, counting their vines by the thousands, while the production of wine is becoming more and more an article of commerce and profit. Between Bernadillo on the north and El Paso on the south the traveler may find and that often in great perfection both the light red wines of the Rhine and Bordeaux, and as he goes south the heavier Burgundy, Port, Sherry, and, with age, even a good Madeira.

"With a grape acclimated by two hundred years of cultivation, unexcelled for richness and lusciousness of flavor, always free from blight and disease of every kind, so destructive to European vineyards, so fatal to vine growing on the Atlantic slope, and so damaging even to California; with a soil as rich as that of the Nile, with abundance of water for irrigation, and with sunny days and dewless nights, increasing in strength as the summer heats increase, the wines of the Rio Grande promise to become as varied and as excellent as those of France and Spain."

The juice of the El Paso grapes is heavier than from the grapes of Madeira or Portugal, as the grapes remain on the vines until they commence to dry, before being crushed; and the wort contains as much sugar as the sweetest of Malaga. A thousand gallons of pure grape juice wine is manufactured from an acre of vineyard, which has cost for tending about twice as much as an acre of corn. As soon as grapes of proper size shall be introduced, Mesilla will become as famous as Smyrna for its raisins. These grapes already here make an excellent raisin, except in size.

The soil of the grape growing district is composed of the disintegrated matter of the older rocks, and volcanic ashes is light, porous and rich. The frosts in winter are just sufficiently severe to destroy the insects without injuring the plant, and the rain seldom falls in the season when the plant is flowering or when the fruit is coming into maturity, and liable to rot from exposure to dampness.

AGRICULTURE.

There are certain portions of the Territory unfit for cultivation or pasturage, but all the river valleys, as well as the table lands lying within reach of irrigation, are exceedingly productive, the soil possessing elements of great fertility, the occasional scarcity of water alone preventing the more arid portions from producing excellent crops and superior indigenous herbage.

The soil of New Mexico, as well as Colorado, is peculiar. In past ages the elements had pulverized the mountain rock, and covered the neighboring plains with this material. Sometimes large areas are met with of this soil, which have evidently been at some time immense lakes. It can not be called sand, it is too fine, and has a floury feeling to the touch, but is mostly mineral matter. If such a deposit had occurred in Illinois, with its moist climate, a heavy mass of vegetable matter would each year

have grown and decomposed, until the black loam of the prairie had taken the place of the mineral soil. But here what little moisture there is induces a spring growth of grass to be cured into hay as it stands, by the summer sun, the soil of course retaining most of its mineral character. On the other hand as soon as water is brought to the soil, the most astonishing crops are the result.

The silex which the soil contains is just the thing for the wheat and similar grain, and the crops are raised year after year from the soil which is strengthened by every irrigating overflow which it receives. The most abundant crops of the Territory are those of corn, wheat, barley, oats, apples, peaches, apricots and grapes. All of these grains and fruits thriving readily, and the crops being of excellent quality. Consequent upon the necessity of irrigation, cultivation of the soil is confined to those localities where water from the rivers and streams can be readily obtained. Wheat yields more abundantly in the northern part of the Territory. Apples will grow from the Taos Valley south, but peaches cannot be raised to any advantage north of Bernadillo, in the central section, but it is likely they would do well along some of the tributaries and main valley of the Canadian River. They appear to grow well and produce fruit without irrigation in the Zuni country, and the valley of the Mimbres is also adapted to their culture. Apricots and plums grow wherever apples or peaches can be raised. Cabbages grow large and fine. Onions from the Raton Mountains south have the finest flavor I ever tasted. They are very large, growing to a diameter of seven and eight inches. They are white skinned and not rank and strong like the rest of the onion family.

Sweet potatoes have been successfully tried in the neighborhood of Fort Sumner, and along the headwaters of the Rio Bonito. Melons, pumpkins, frijoles, &c., are raised in profusion in the lower valleys, and cotton was formerly raised in limited quantities. Frijoles, or beans, are, next to flour, the staff of life

for the Mexican. They are eaten at nearly every meal. They are extensively cultivated and yield well. Chile, or pod pepper, of excellent quality is raised everywhere, and extensively. It is said to excel in quality that raised anywhere in the States, on account of its mild nature, and is extensively used in cookery, and as a standard dish. Americans soon learn to eat it as it is cooked by the Mexicans.

Meats are often cooked in gravy which is perfectly red with the chile which is used to thicken it. In the southern part of the Territory I have often seen the outside walls of the houses completely covered with the strings of red pepper which hung from the roof, and have met the wagons of the Mexicans loaded with red pepper and nothing else. The only forage crop yet reared is alfalfa, which can be cut five times during the summer, and gives a yield of eight tons of green feed to the acre, at each cutting. Land fully stocked and watered freely requires no other care. Its roots are large, strike to great depths, and are permanent for many years for dried fodder. Corn or sorghum, planted in drills, or sown broadcast, and late sown wheat or barley, might be used successfully. Large quantities of hay are cut on the plains whenever a fair supply of summer rains have fallen.

Beets, carrots and turnips for feeding stock or household use need not be raised from the ground till required for use, as the frosts do not injure them, especially if they are watered during the winter.

One writer estimates the agricultural lands of New Mexico as being capable of supporting a population of 10,000,000 people. On this point it is very hard to draw the line.

As population increases, land will be irrigated that had been supposed to be too expensive to irrigate. Artificial lakes will be made in favorable locations to store the water that runs to waste. Wind power will be used to elevate water, first for garden and afterwards for field crops. These, and similar appliances, will put so much more land under irrigation, that the increased area



exposed to evaporation will give off more moisture to the air, to be in turn chilled by the mountain wind, causing increased rain fall.

IRRIGATION.

The necessity for irrigation, which exists in New Mexico, Colorado and some other Rocky Mountain countries, which at first sight appears to be a drawback, is really not one at all. The expense is no more per acre in putting land under ditch, than in clearing timber, or even breaking prairie land. The expense of course varies with location. In most cases irrigating ditches are built by companies of persons, who employ their time in their dull season, in the winter if they like, when an eastern farmer is busy feeding to his cattle the food which he raised in the summer. I do not think the time used by the Rocky Mountain farmer in building and repairing ditches is any more in any given five years than is lost by the eastern farmer by rainy weather.

The benefits of irrigation are, first, the control the farmer has of his crop by adding to it the amount of moisture needed, and no more; secondly, fertilizing his crop by irrigating. Land under irrigating ditches continues to be of unexhausted fertility for hundreds of years, without manure from any other source. This is the case with the land of the Pueblo Indians, which has been cultivated for centuries.

Besides these advantages, the farmer regulates the work to his own will instead of being compelled to labor at irregular and uncertain intervals. The yield is also increased, from the fact that the farmer can, at the commencement of the season, put the land into the best possible condition for plowing; next, for the best sprouting of the grain, and follows the crop with water at just the right time, until the harvest is gathered.

A residence on irrigated land is more healthy than on prairie land, for there is no ague or malarious diseases prevalent,

which are common to damp soils. One of the simplest methods of laying out irrigating canals is by the aid of a triangle. A frame of wood is provided like a capital A. A line with weights is attached to the apex of the A. When this frame is held upright with the two feet of the frame on points of land of exactly the same level, the cord will hang opposite the centre of the bar. By a little experimenting a scale on the cross bar is soon marked, which will soon show the position the cord should have when one foot of the frame is on lower ground than the other. If the feet of the frame are $\frac{1}{2}$ rod apart a difference of $\frac{1}{2}$ inch in height is often decided upon, as this shows the fall of one inch to the rod, which is a very good one. A less fall necessitates a large ditch to carry the slow moving water, which soon deposits large amounts of matter held in solution, which requires the ditch to be cleared of this deposit, which, with a more rapid current would have been carried to the land, where it is needed.

A greater fall than one inch cuts the ditch out very fast. A piece of land being selected for irrigation, the triangle is brought into requisition. Small stakes are stuck at the points indicated by its position and the route is soon marked necessary for the canal to follow from the river to the upper side of the land to be irrigated. If ledges of rock or ravines are in the way, resort is had to surveying instruments.

Where very large canals are constructed, immense districts are brought between them and the river under cultivation. By commencing an irrigating canal high up in the mountains, where the fall of the stream is great from which the water is taken, a great deal is gained, for as the canal emerges from the mountain canon, it is very much higher than the river, and it is customary to run the canal along the base of the mountains, all the time leaving the river as fast as possible, so that soon large bodies of land are brought under ditch. It is often the case when one is traveling up a mountain canon with a canal on one

side of it, that it appears to be climbing the hill as it runs on the side of the ravine. The deception is more perfect when, as is often the case, the canon widens into a grassy park, which appears to be level, but which really has a rapid descent towards the mouth of the canon.

CATTLE RAISING.

A large part of the land in New Mexico is suitable for stock raising. Indeed, one of the first efforts of a settler in any new country is by some to get what start he can in stock raising. As he sees so much grass annually going to waste, he reckons his loss way into the tens of thousands annually from not having the stock to eat that grass up.

If he has no money he sometimes can arrange with some one to take cattle on shares for a term of years. But this arrangement can not be as readily made as formerly. He can go to Texas and buy cattle at from \$12 to \$15 per head, and by crossing with thoroughbred bulls at an expense of about \$100 each, a good breed of cattle can be obtained. A ranch is necessary, which can be procured either by locating on government land or buying some one else out. Many of the inhabitants of a new country are ready to move at any time. If they are mining, and making good pay, and some stranger tells a good story about some other country, if that place is only far away, they will believe it and leave at the first opportunity. If such people are farming or stock raising their improvements can be bought for much less than they can be made for, to say nothing of the fact that the location may have advantage that cannot be secured in a location made later.

After a ranch is located, the cattle are kept within fifteen or twenty miles of it, a brand having been put upon them, which is different from any one else for hundreds of miles. A herder is necessary for every 500 to 1,000 cattle, to keep them on their

range. Their wages are \$20 to \$30 per month and their board. Their horses are furnished, but they furnish their own equipage. When the round ups occur, each herder is provided with eight horses. As the horses have nothing but grass, they cannot endure the hard riding without frequent rest. These round ups occur twice a year, when all the cattle within certain limits are driven to some central point.



This immense herd is held in place by a circle of mounted men, while the different owners of the cattle drive out their branded stock, with the unbranded calves following their mothers. After this division the young stock are branded and turned loose again. At the round ups sales are made, and herds of steers driven out for beef. They sell at from \$20 to \$30 per head.

As to the profits of the business, any one can see that there is money made in it. The cattle require no hay for winter feeding. The expense of raising them being the herding, hunting up strays, &c.

But cattle men help each other by exchanging information in regard to cattle seen in certain locations, what their brands and marks were, &c. As a country becomes filled with cattle, the owners improve their stock, and find that, with a limited range, there is more money made by having good stock than by filling up the country with poor ones. The vicinity of mountain streams and springs is occupied more by ranchmen devoting themselves to dairying. The mountains of New Mexico and Colorado have sweet, short grasses, which give such excellent pasturage that the finest of gilt-edge butter is the product.

SHEEP RAISING.

Is more generally carried on in the southern part of the Territory than the northern. The grammar grass of the plains is the food. It is excellent pasturage when green, and cures itself as it stands, for winter feed. The original stock of sheep is Mexican or Chihuahua. They are coarse wooled. The fleece will average about $1\frac{1}{2}$ pounds, while the dressed carcasses will give about 30 pounds of lean meat, spread thinly upon the ribs. They have been much improved by crossing with Merino.

The common sheep can be bought for from \$1.50 to \$2.50 per head, that will shear about two pounds of wool. Rams cost on an average \$25 per head, when selected with a view of improving the stock. The herds are made up of from 1,000 to 2,500 sheep for each herder. Dogs are not generally used, they frighten the sheep, and run them two or three miles some times. Herders receive \$15 per month wages, which includes board. The ewes lamb May 1st, and in buying a flock near that time you generally have to count the lambs as sheep whether they are yet born or not. Shearing begins about June 1st and again about the 10th of October.

The American sheep shears on an average five lbs. of wool. The American rams fleece about fifteen to twenty pounds of wool. In lambing, about two-thirds of the Mexican sheep have twins, and the others one each. The Mexicans will, in ten cases out of a hundred, have twins. In an American flock, well managed, 90 per cent. of the lambs can be raised. Born in May, if they live through the winter they are all right.

The American or graded wool is worth from two to five cents per pound more than the Mexican. The former is used for clothing and the latter for carpets, government blankets, &c. In a flock of 2,500, the ewes can be kept for 50 cents per head and the weathers for 25 cents a head per year.

From these figures an estimate can easily be made of what a flock will produce in a year:

EXPENSES:

1,500 ewes, at 50 cents each	\$750 00
1,000 weathers, at 25 cents each.....	250 00
30 bucks, at 25 cents each	7 50
	<hr/> \$1,007 50
2,500 fleeces, 5 lbs. each, 25c. @ 1 lb..	\$3,125 00
30 buck fleeces, 15 lbs. each, 25c.	112 00
	<hr/> \$3,237 00
Profit	\$2,229 50

This does not include of course the cost of the sheep on the side of expense, nor the increase on the side of profit. The price of wool is put at twenty-five cents, it has been as low as fifteen cents, but is now worth thirty. A favorite way with wool gatherers in New Mexico is to own the sheep and let them on shares.

There are two plans in common use, in the first the owner lets them on the "half and half" principle, that is, the owner gets half the wool and half the increase, and the lessee pays all the expenses. In this case of course the lessee must have some money to begin with, and to handle a flock of 1,000 head he ought to have \$1,000. The sheep ought always to go in a pen at night.

The lessee has a herder, and the herder takes care of the sheep, while the lessee stays in the camp and looks after things there. He sometimes has his family with him. The other way is the $33\frac{1}{3}$ per cent. plan. The lessee gets half the wool, and the principal gets half, and the lessee guarantees to the principal an increase of $33\frac{1}{3}$ per cent. on every 100 head, and all the wool from the $33\frac{1}{3}$. The second year the lessee pays $33\frac{1}{3}$ per cent. on the 100 head and not on the 100 plus the $33\frac{1}{3}$ per cent, All above the $33\frac{1}{3}$ per cent. goes to the lessee. The lessee pays all expenses. In this way the flock doubles to the principal every three years. For example, suppose A. leases to B. 1,000

head of sheep. The first year B. gives to A. 500 fleeces, the second year $833\frac{1}{8}$ fleeces, the third year $1,166\frac{2}{3}$ fleeces and the fourth year 2,000 fleeces and 2,000 head of sheap, and B. keeps the remainder.

The cost of shearing is three cents per head, and a man can shear from twenty-five to sixty per day; on an average forty. When lambs are dropped, boys have to be hired to take care of them for eight or ten days, till they can care for themselves. Suppose a man comes from the east, and starts in the business; during the first year his expenses will be about as follows:

1,000 sheep at \$4.....	\$4,000 00
20 bucks at \$25	500 00
One herder	300 00
Boy to attend to lambs	42 00
Shearing	500 00
<hr/>	
Total.....	\$5,342 00
5,000 lbs. wool at 25c.....	\$1,250 00
300 lbs. buck wool, 25c.....	75 00
Increase 1,000, at \$1.....	1,000 00
<hr/>	
	\$2,325 00

His revenues the first year will pay nearly one-half and will easily pay one-third of the cost of starting in business, and what his profits will be in succeeding years the preceding table shows. Sheep are much more largely kept than formerly. As the railroads have come nearer to New Mexico, they have raised the price of wool by lessening the price of transportation, bringing more buyers in the market. They have also shortened the time for putting wool into consumers' hands, which has enabled the dealers to handle the clip at much less profit per pound than formerly.

All these changes have been of direct advantage to the producers, and they have increased their business accordingly.

CLIMATE.

Owing to the elevation of the country the the air is pure and dry, and very healthy, especially for those of consumptive tendencies.

The whole country has an elevation, above the sea, of 5,000 feet on an average, and at several points runs to 12,000 feet.

We quote further in regard to the climate, from a letter of Dr. Lew. Kennon, formerly connected with the United States Army, stationed in New Mexico, and who is a leading physician in the territory. In the letter referred to, writing of New Mexico, he says:

* * * "It is certain that even when the lungs were irreparably diseased, very much benefit has resulted. Invalids have come here with the system falling into tubercular ruin, and their lives have been astonishingly prolonged by the dry, bracing atmosphere.

"The most amazing results, however, are produced in warding off the approaches of Phthisis, and I am sure there are but few cases, which if sent here before the malady is well pronounced, would fail to be arrested. When hardening has occurred or even considerable cavities been established, relief altogether astonishing takes place.

"The lowest death rate from tubercular disease in America is in New Mexico. The censuses of 1860 and 1870 give 25 per cent. in New England, 14 in Minnesota, from 5 to 6 in the different southern states, and 3 per cent. in New Mexico.

"I have never known a case of bronchitis brought here that was not vastly improved or altogether cured, and asthma as well.

"Rheumatism and diseases of the heart, with or without a rheumatic origin, do badly here. Valvular difficulty in that organ is invariably made worse. But the most astonishing effect of this climate is seen in those cases of general debility of all the functions of body and mind—that used up condition, the

pestilent nuisance of physeians in the great cities. People come here in a sort of debacle, having little hope of living, and often little desire to, and the relief is so quick as to seem miraculous.

"I have no doubt that when means of access to this country are better, and therefore it being better known, it will rival or supersede Florida, Madeira, Nice or Dr. Bennett's much vaunted paradise of Mentone, as a sanitarium. The country is far distant from either ocean; it is utterly free from all causes of disease. The atmosphere is almost as dry as that of Egypt. The winters are so mild that there are not ten days in the whole year an invalid cannot take exercise in the open air. The summers are so cool that in midsummer one or two blankets are necessary to sleep under. The whole territory has been always astonishingly free from epidemic diseases.

"For weak or broken-down children there is surely nothing like it on the face of the earth. With them the law of survival of the strongest, here seems not to obtain at all."

"In order to understand properly the differences in climate and productions observable in the different parts of this section, it is necessary, not only to take into consideration the latitude, but also the variations in altitude, and proximity to high mountains. Beginning at the San Luis valley in Colorado, with an elevation of 7,000 feet above the level of the sea, we find when we reach Santa Fe in New Mexico, the height is still 8,640 feet, which is higher than some of the valleys further north. Keeping on the same plateau, and moving south, the elevations of the principal points are as follows: Galisteo village, 6,165; Los Cerrillos, 5,804; Canon Blanco, 6,320, and a little southwest of the canon near Laguna Blanca, 6,943 feet. Moving southwest from this point towards Albuquerque, we find the elevation at San Antonio is 6,408 feet. But when we descend into the immediate valley of the Rio Grande, as far north as Pena Blanca, it is only 5,288 feet above the sea level, or 1,552 lower than at Santa Fe."



PART SECOND:

SKETCHES OF CAMPING, GIVING EVERY DAY LIFE
OUT OF DOORS.

PEN PICTURES OF MEXICANS AND INDIANS, SHOW-
ING HOW THEY LIVE, WHAT THEY DO AND
HOW THEY AMUSE THEMSELVES.

ALSO, SOMETHING ABOUT ARMY CONTRACTS, AND
WHERE THE SWINDLE COMES IN.

CONCLUDING WITH A COMPLETE EXPLANATION OF
MINING TERMS.

AND A VALUABLE CHAPTER, ENTITLED: "HOW
TO PROSPECT," WITH INSTRUCTIONS
FOR ASSAYING CARBONATES.

CAMPING OUT.

As will be seen, the following description of camp life applies to a trip made across the plains, but as any one traveling away from car-or stage routes would be likely to have a similar experience, it is put in print, and will be interesting to those contemplating any such mode of travel.

Seven years ago the stage and the emigrant wagon were the means of transportation to the country of which I write. Provided with an unpretentious specimen of the later class of conveyance, I started from Ft. Elsworth, Kansas, for the Rockies. My companions were the animals that I drove and the cargo was an assortment of grain bags, cooking implements and provisions suitable for man and beast. Of the provisions, staples like bacon and coffee formed the bulk, for of all modes of life, camping out is the thing for producing an appetite in the most delicate of invalids. But I was neither an invalid nor delicate, on the contrary, I was positively voracious at the start, hence the necessity of a bountiful commissary department.

Although palace cars have in a measure superseded wagons, still, for the long drawn out tonic of the air of the plains, the old style is the best, especially as it gives the advantage of a gradual change of climate. This advantage is generally overlooked by most of those who come to the Rocky Mountains for their health. In fact they do not think much about going anywhere until they are thoroughly frightened. Then a palace car lands them in New Mexico. Their next move is for the mountains, where, from an altitude of from 8,000 to 12,000 feet, they are too often convinced by some fearful hemorrhage that they have either come too late or when here have attempted too rash means for their cure. Mountain air is all right, but it must be taken in time and under the proper circumstances.

I will give you an actual inventory of cooking implements necessary for camping out, especially as there are many parts of



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New Mexico that cannot be visited, with any certainty of regular meals or accommodations suitable to the tastes of the visitor, unless material is taken right there in the wagon. Be it known then that the smallest assortment of cooking utensils that can be used, without a lapse into barbarism, consists of a frying-pan and coffee pot, with a tin cup, plate, knife and fork for each person.

For getting up a "square" meal with these tools this is the programme: A fire is kindled, and a position taken by the cook as near the water as possible. A loaf of bread is mixed in the frying-pan. On being supported as upright as possible near to the fire, the bread is soon baked. Or, if there is any hurry, the frying-pan does duty only until the loaf acquires stiffness enough to stand alone, by the aid of a sharpened stick, on which it leans. The frying-pan being relieved, the meat and coffee are soon cooked. If you prefer your coffee freshly ground, without the expense of freighting a coffee mill, you can have it by crushing it in a cloth. The expense per day of running an elaborate affair of this kind is from 35 cents upward for each person, according to the prices current at the supply point and—who eats.

I have traveled several hundred miles at a time on horseback with such an equipment. But with all the changes of fare possible under the circumstances, one tires with the monotony, and is apt to run into the opposite extreme and invest in all possible cooking utensils, and astonish his traveling companion with a variety of nicely cooked food. This can be done, but when packing time comes the wear of the brain is fearful as it tries to solve the problem of packing the mess chest with what is left, so that the next piece of rough road will not hopelessly mix everything. The question is generally solved by throwing away most of the cooked food and doing the same thing the next time. In buying supplies for camping out please adopt a medium course, be happy and go back with me to where I started, from Fort Elsworth.

I had soon overtaken a train of mule teams, and considered myself safe in their company from the attacks of the Indians, who were hostile that season.

Day after day we traveled with the regular walk of the teams which is always taken when carrying freight. The road was hard and good, and led us, with the Arkansas River on our left and irregular bluffs and table lands on our right, across the carpet of varied grasses ripening in the September sun for the buffalo and cattle who might need it during the coming winter. An occasional jack rabbit, cayote or antelope crossed our track or viewed us from a distance. But neither the wished for buffalo nor dreaded Indian put in an appearance.

This was the condition of things one forenoon, about ten o'clock, as the wagon master of the accompanying train rode by my side. But suddenly he interrupted the conversation by exclaiming, "Here is business, this wont do, keep the noses of your cattle three feet from the wagon next ahead of you. I'll make a double line of the teams, we may corral any minute." As he spoke he dashed ahead and the teams were soon in double line, ready at the least alarm to turn the animals towards each other, thus bringing them between and protected by the huge wagons in case of an attack. I obeyed orders, supposing there were Indians in it all, but wondering where they were to come from. But, when everything was on a war footing, the wagon master came back and explained things as he could, amid the orders that he thought best to give to his teamsters.

"We will corral," he said, "at the first good bend in the river, if the Indians do not make us do it before." I asked him where the Indians were. "Don't know, haven't seen any, but I saw sixty pony tracks when I was with you before. They were not an hour old, and pointing to the bluffs. They were on the war path, because there were no lodge poles dragging. The whole crew are liable to tumble over these bluffs any moment, and then there will be music."

As I did not want anything of that kind, I thought I would obey his orders, and watched my team accordingly, occasionally eyeing my revolvers, which lay on the seat, to see that they were still there. Meanwhile my companions turned the teams to a point of land which was protected on three sides by the Arkansas. After arranging the wagons in an oval position across the neck of land, the animals were allowed to graze just outside, with lariats around their necks and men at hand to take them inside the lines if necessary.

The teamsters resolved themselves into a committee on repairs of the various "shooting irons" in camp. The repairs were sadly needed, for it took two hours of industrious tinkering to enable us to make a respectable review.

About this time the wagon master's glass showed him two officers in uniform on the road we had left. On taking the glass I discovered one of them to be an acquaintance of mine, and rode out to meet him. I told them the reason of our alarm, and asked where their troops were, as we were waiting for escort.

"Oh, back here a couple of miles," was the reply. "I will camp when they come up and you can go with us to-morrow, although you must be mistaken about Indians, for I have not seen any since we started." On that point I had my own opinion, but felt sure there could be no Indians in the immediate vicinity, as they would never have seen two officers out loose without taking them in.

Soon after we commenced our drive of the next day, accompanied by the military, we came upon the scene of an attack by the Indians, whose tracks we had seen. On the plains near the road were overturned and half-burned wagons, dead horses and scattered military stores, taken from the captured wagons, while by the roadside were the graves of the five whites killed in the attack.

We learned at the next fort the particulars of the fight. It was about the same thing as usually occurs. The hidden Indians

rushed over the bluffs with their hideous yells. The teamsters had all they could do to keep their animals from running out of the train, so that returning the Indians fire was impossible.

The five unfortunate men, who could not control their teams, were carried by them from the train and were immediately surrounded and killed; while, of the forty whites attacked, but five find their guns.

The whole system of Indian warfare consisting of an attempt to take their enemy by surprise, and retiring as soon as the surprise is over.

A few miles further on a smiling wagon-master was met, whose coraled wagons was in sight, without any animals. He requested a few troops of the officers to go across the river and bring in his mules, which had been run off by the Indians, and were in sight among the bluffs. That smile vanished when the officers told him it was impossible; that his orders were imperative to remain in the traveled road. In vain the owner of the train begged for just a few men, and went away meditating on the beauties of red tape, and studying whether he should risk his life single-handed, to recover the \$10,000 worth of mules, the loss of which would beggar him. Of this red tape, more again.

A few more days of travel found our company increased by everything that happened to be going west, on wheels. There were Mexican trains, with their immense wagons, capable of carrying 6,000 and 8,000 pounds, drawn by the smallest of cattle, but a great many of them, and driven by Mexicans, who gathered around their evening camp fire and were happy as long as the tobacco and corn husks lasted, of which they make their cigarettes.

All this time the train has been moving on with the regular marches, commencing at two o'clock in the morning and ending in the middle of the afternoon. These early marches were made so that as much as possible could be done in the coolest

part of the day. After camp had been made, and the work disposed of, a good deal of hunting was done, although no one dared venture far enough from camp to kill anything larger than rabbits.

The doctor of the regiment was always on the look-out for something new, and on one occasion a soldier came into camp with what he called a big spider, on a stick. The stick was very short, and it was a wonder to us all that the big spider, which was no other than a Tarantula, had not bitten the man. As it was, we did not tell him of his peril until Mr. Tarantula was safely bottled in alcohol.

There was a great variety of scenery at our different stopping places. On one afternoon our camp would be on some level plateau, or slight slope of ground with the short, curling buffalo grass for the ground work of a carpet, while the never-ending variety of prairie flowers put the colors in with a master hand. At another time we camped in a canon with the massive cliffs all about us. These cliffs were covered with the nests of the mud swallow, who made everything ring again with the echoes of their constant twitter. Just at the base of the cliffs were deep pools of the clearest water I have ever seen. Their sides were of stone, while the overhanging rocks kept the wind from fretting their surface, and made them fit mirrors for the dusky Indian beauties which Cooper tells of but were never seen.

In this canon I had my introduction to the cactus, or prickly pear, of the country. The cattle had strayed and I was trying, in the night, to drive them back to camp. We came upon a clump of bushes, as I supposed. The cattle backed out; I did not like that, and with victory in my eye urged them and myself into the thickest of the clump, in the vain attempt to go through. By that time the victory in my eye had died out, but instead were thousands of cactus needles in every part of my body. Many a time since then has my eyes been gladdened by the superb display of the cactus in blossom—dark reds, cherry

and yellow being the prevailing colors. A group of cactus would take the premium in any display of flowers. The seed bulb or pear is about the shape and size of the wild thorne-apple, and is gathered by the Indians by the aid of two long sticks both of which they insert at once in the berry and pull it from the bush.

A few more day's travel brought us to the semi-civilization of Mexican settlements.

As military escort was no longer necessary, yours respectfully, said good bye to blue-coats and traveled alone thereafter.

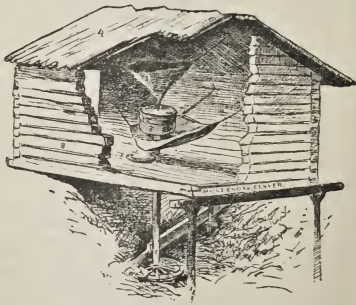
Wishing to buy some corn, I made my first call on a Mexican farmer. Now, he is a small man; lives in a small house; plows his small piece of ground with a small wooden plow, drawn by small cattle, and on it raises small corn, (a little larger than our popcorn).

On festive occasions he mounts a small burro and goes to some feast-day rejoicings in some neighboring town. For every town has its patron saint; and every saint, as well as every dog, has his day. That day comes once a year, and then the whole vicinity turns loose and makes a carnival of the occasion.

When spring opens the average Mexican farmer rouses from his day-dreams, that he has been enjoying, wrapped in his blanket, while sitting in the sun, on the warm side of the house. He calls in the neighbors and plowing begins. He gets the neighbors to assist him for two reasons. First, because he is a decidedly gregarious animal; he loves to work in a crowd. Besides this, in this plowing business, there is economy in running a number of teams at once, for the education of the Mexican ox is peculiar. For when that wooden pole, with the block on the end, by courtesy called a plow, is fastened to his yoke, he expects one able-bodied man to walk in front, while another holds the single handle of the plow. But, if another yoke of cattle is behind they will follow the first plow, and so the more the merrier, and the work goes bravely on. The land

is plowed full two inches deep; the corn is planted and is ready for the water from the irrigating ditches.

But when our farmer has reaped his crop in the fall, it is taken to the neighboring mill and ground in a very convenient way. No watchful miller is there, for the amount of corn necessary to run the mill for the day (about three bushels) is put into the raw-hide hopper and slowly trickles down between the native mill-stones. One of these stones is fastened to the top of an upright wooden shaft, while the lower end has projecting boards which serve as floats to catch the force of the stream of water which spouts against it.



[A MEXICAN FLOUR MILL.]

A Mexican mill is only this and nothing more!

If smaller grain is raised instead of corn, there is another chance for the neighbors to help at threshing time. This time they bring all their horses and mules, and when the grain is piled in the centre of the corral, the animals are turned in and driven around it until all the grain is stamped out. Then comes a day or two of grain winnowing by throwing the straw into the air with wooden forks. During this tedious process the anxious Mexican sleeps beside the straw, to keep his neighbors from stealing the half-cleaned grain. But woe to the man who has a better crop than his friends! He is sure to have poor relations enough to bring him down to the level of the rest.

The interior of the Mexican house, where I made my corn purchase, was so similar to others that a description is in order. The walls are built of adobe and washed outside and inside with plaster of Paris, with a border near the floor of yellow mica, which gives a fine effect. The floor is of the same composition as the walls: while the roof is of poles, covered with earth. The windows are very small, and in many cases the rude sash is covered with cloth. The fire place is very shallow and high, pointed and proportioned like a gothic window; burns the wood on end; gives out a great light and heat; is kept scrupulously clean, and is every way a success. A bed-stead stood in the corner, but I found out afterward that bed-steads were never used except to hold the bedding through the day. At night everything comes down onto the floor, and is spread there.

Trinidad was soon reached and proved to be a lively town, on the north side of the Raton mountains, and near the boundary line of New Mexico.

Here the Jew trader, who is present in every town in the southern part of Colorado and all over New Mexico, flourishes. Most of the houses are of one story, and occasionally a two-story building puts in an appearance. On one of the latter a drunken tinner had been at work, as I passed through, putting on a new roof. He was missed by his companions, who had left him, to

go to dinner. On search being made, he was found with his face up, on that bright roof, lodged against a chimney at the edge, sleeping off the liquor, in the sun. That man looked very much like a lobster when they brought him down and put him in a safer place.

From Trinidad the road takes you across the Raton mountains and into New Mexico.

The next place of importance reached is Ft. Union. The buildings are of adobe, in many cases plastered outside with sifted earth of a light-gray color, and finished with a cornice and window trimmings of brick. The contrast of color gives a fine effect.

A few miles more of travel brings one to Las Vegas, a good sized town, doing considerable business.

One Mexican town resembles another. There is always an open square in the centre, treeless and barren, with the exception of Santa Fe, which has a plaza beautifully shaded with trees, while around it are the houses built of sun-dried brick. But these towns never burn; there is nothing in the world to light up. I have read of an Indian who crept up in the night to burn a adobe house. A donkey stood by in utter amazement at the insane attempt. Mr. Indian tried every way he could think of, to get it blazing. But it was of no use, and he had to give it up.

Continuing south on the road to Santa Fe, the ruins near Kosloskis Ranch, are the next thing to attract attention. There are the ruins of a large church, built over 200 years ago. The roof has long since fallen in, but portions of the carved rafters still show what it once was, while the massive adobe walls tell you that mud can be made to last. Near the church are the ruins of a Pueblo Indian village. Their houses were several stories high and two cellars deep. Provided with a bundle of matches I undertook to explore an underground passage that was believed to lead from the town to the church. I gave it up

after I had dug through several cellar walls, and finally brought up in a deserted wolf den.

After reaching Santa Fe I disposed of my team, and from there made several trips on horseback, to different parts of the country. On one of these occasions, I had started for Ft. Sumner, but from misunderstanding the language, I took the road for Albuquerque, across the country but little traveled on account of the Navajo Indians. At 10 o'clock at night I was still riding my tired horse, and was beginning to despair of seeing any more human beings, when from a hillside three men came to the centre of the road, and in the darkness set the butts of their muskets down with a determined ring, at the same time calling out Navajo! I took it for a challenge and replied, *Americano!* By signs I was made to understand that I was to get off the horse. I was undecided at first, for I was not sure whether I was a prisoner or not; but as everything seemed friendly I thought I might as well dismount, and did so, trusting to my pistols for the means of a demonstration, if it should be necessary. My horse was hobbled and I was conducted to the camp on the hill. The dying fire was rekindled and supper was soon cooked. While this was going on I interviewed the situation. Around me were several thousand sheep; four Mexicans had them in charge, armed to the teeth; a few goats to furnish milk, and four donkeys to carry the provisions, were along. When the time supper was announced I was ready for it. Did you ever eat *tole*? It is a porridge made of milk and meal; a little too thick to drink readily and not quite thick enough to eat with a spoon, to advantage. This time I forgot how I did eat it, for I disposed of it in a hurry, as I wanted to find out where I was. In answer to my signs and enquiries, I concluded that Albuquerque was 25 miles off, in the direction I had been going. I held up my fingers, spoke the word Albuquerque and imitated the motions of a horse galloping towards it. In return the Mexican counted off twenty-five with his fingers, but went through the motions

of sleeping three times. This disgusted me; it seemed entirely unnecessary for him to think it would take me three days to go twenty-five miles; and I proposed to prove, the next day, that it could be done in less than one. Accordingly, in the morning, after a hearty meal of tole, I paid the Mexican for the entertainment, and started off. Noon came without water or any indications of human life, and night brought nothing more, except a pool of stagnant water, at the junction of two roads. Here I resolved to camp until the moon should rise. There was evidently a mistake somewhere, for I had already ridden over forty miles, and as my horse made a hearty meal from the grass at the edge of the pool, I indulged in a few supperless reflections. Why were the Mexicans afraid of Navajos? was one query. The answer came when the moon arose, and I found some fresh graves torn up by the wolves, which proved that the Indians had been lately around. I resolved to start away at once and take my chances of taking the right road. But, when I went to catch the horse, I found the strap had slipped off his foot; and that to be caught and leave that grass, with the chances of another waterless forty-mile ride, was entirely foreign to his calculations. In vain, during that moonlight night, I tried every experiment I could think of. I assorted gravel stones so as to resemble corn, as nearly as possible. With a quantity of them in my hat, invectives in my heart, and my most winning arrangement of smiles on my face, I approached that independent brute. But he was proof against all beguilements, and remained independent for the next three days. Meanwhile I kept myself and saddle hid during the day, at some distance from the lake, occasionally visiting it for water; meanwhile watching all approaches for coming friends or foes. When night came around I would invariably dream of something to eat. I suppose because there were no eatables on my stomach they were on my mind. I had, at one time, been to a public dinner, on the glorious Fourth, at old Faneuil Hall in Boston. I thought

I was highly favored when I was presented with the ticket; I had voted it a bore when I came out, it was so fearfully mixed with bunkum speeches, champagne and tobacco smoke. But on the morning of the third day I dreamed of it again. Everything tasted first rate, but instead of fifteenth amendments for waiters, there were Angels with rustling wings. I thought this amendment was still better, but awoke on that dreadful day to find that my Angel's rustling wings were those of a flock of red-headed buzzards, slowly sailing above me and occasionally sweeping down to see if I was ready to eat or not. About noon I took my pistol to shoot the horse. I hated to do it for I should have to fight buzzards by day and wolves by night, while the meat would keep, which would be at best, but two or three days, and I thought I would fast one day more anyway. So after filling up on water as usual, I went to my hiding place again. In an hour or so I saw a little cloud of dust in the direction from which I had come. I watched it until I saw it was occasioned by the advance of a Mexican, and to my great joy, one of those whom I had left at the sheep camp. He comprehended the situation at once, and in answer to my invitation to catch the horse, with his lasso, which I gave him by holding up the bridle and a bank-bill. He nodded assent, but introduced a few motions to show that I had better have some dinner first, and pointed back to show where the dinner was to come from; and then in full view, just coming over the hill, were the sheep, donkeys and all. We all had dinner—it was tole again—and several courses of it. But you may know it was very good, and as I wiped the sticky stuff from my mustache, I thought my troubles were over. But not quite, for while I was growing weak my horse was growing fat and saucy, and refused to be caught, even with the well-thrown lasso. We four tried it until we were tired, but noticing that when close pressed he would dash in between the donkeys, who stood in a bunch, and then as we closed in on him, he would go out in another direction.

We laid a little trap for him by tying them together, with considerable slack rope between each donkey. This worked beautifully, for the next charge drove him into the group, when he was entangled in the ropes and nicely caught.

Another ride of thirty miles brought me to Albuquerque, where I found the route I had traveled was seventy-five miles long; that it was very rarely traveled at all, except in the rainy season; and that generally the lake where I stopped was entirely dry at that time of the year.

The twenty-five that the Mexican had counted off was intended for leagues of about three miles each.

Albuquerque proved to be a fine place, as Mexican towns go. I saw here the curious sight of mud or adobe fences. They are built in a very simple manner, two parallel ditches being dug. The earth taken out is mixed into mortar, with which the wall is built, on the space between, the mud being moulded on the spot, as we do grout.

After my return from the Albuquerque trip, I went to Ft. Sumner, this time without missing the road.

NAVAJOS.

Several thousand of these Indians have a permanent camp at Ft. Sumner. They are large-bodied men and did not look so very murderous. Their houses were made by digging a round hole some fifteen feet in diameter and four feet deep. Poles were then set up on the bank, and coning together over the centre of the hole, were covered with earth. In these half underground houses, the most durable and valuable blankets in the world are made.

When a Navajo Indian draws his allowance of colored cloth from the government, he proceeds to ravel it up and spin and weave it over again, in a respectable manner. As this alone will not keep him busy, he steals sheep on a liberal scale, the

wool from which helps him out on the blanket question. The loom is a very simple affair, being nothing but an upright framework to hold the warp, the yarns of which are stretched on the frame of the same length and width of the required blanket.



[NAVAJO INDIAN.]

with great force. She packs the thread against its neighbor so tight that no wind can penetrate the fabric, and even water can be carried in the blanket. The most expensive blankets are woven of a great many colors in small squares of about two inches across. As the color is the same on both sides, the filling yarn of each color has to be woven separately, making it necessary to use as many as thirty pieces of yarn of as many different colors to weave equal to one yarn across the entire width. These blankets will often bring from \$50.00 to \$75.00, and have been sold as high as \$300.00 each.

I have been so minute in my explanations of their process

Mrs. Navajo takes a position in front, and with the aid of a flattened stick, (very similar to a common ruler) which is inserted between every other thread. She first makes a space to enter the cross thread, by turning the ruler up with its edge towards her. The yarn being in she turns the ruler flat again, and by repeated strokes with it downwards

of weaving, because I think something on the same plan could be introduced for fancy work for ladies.

A Navajo Indian is an inveterate monte player. They use for stakes whatever is on hand. When I was there, there had just been a distribution of knives and forks. A squaw that passed me was an adept at monte, and she had an apron full of knives and forks, won from the other Indians, to show for her success.

The government treats the Indians as they do from the best of motives, but the results are often comical, to say the least.

In the Kaw valley, in Kansas, can be seen substantial stone houses built for Indians. On the outside you can see the blackened walls where the camp fire had been built against them; the inside being used as a stable for the horse.

PUEBLO INDIANS.

There are nineteen towns of these Indians, including that of Pecos, the one most recently depopulated, and whose remnant of inhabitants removed to and incorporated themselves with the Jemez Pueblo, some years since.

These interesting inhabitants of New Mexico are an important, and when they assume the practical exercise of their political rights and privileges, a powerful constituent of the body politic.

They have flocks of sheep, of goats, of herds of cattle, of horses, which they pasture upon that part of their land unfit for cultivation. These flocks are always attended by pastorals, who drive them to their pasture grounds in the morning and return them to the village, for safety, at night.

Under the Mexican government they voted and held office, and enjoyed all the right of citizenship—rights which have not heretofore, however, been acknowledged by the United States.

All through New Mexico they may be found. They take the name of Pueblo, from the fact of their living in towns. They cultivate the land in the vicinity of the towns, but are constantly robbed by their Mexican neighbors. During the season of their ripening crops, they watch their fields from elevated scaffolds, to keep what they can. On the contrary they are never known to steal themselves, nor become intoxicated. There are many theories as to their origin; all that is certainly known is, that they were found by Cortez living in their fortified towns as they do now. They speak five different languages. People of one town very often not, understanding those of a neighboring town. Their houses are built in blocks, around a hollow square. The houses, which are generally of three stories, are built without windows or doors to the first story. A ladder taking you to the top of the first story onto a terrace; a trap door in the terrace letting you down into the first story. The wall for the second story recedes from the line of that of the first, the width of the terrace, and the wall of the third story recedes from that of the second. The ladder being drawn up at night leaves everything secure.

They are governed by a set of officers elected by themselves, one of which has charge of the military movements; another of their farming arrangements; a third corresponds to our justice of the peace. The highest officer, from the top of the houses, at evening, tells his people the news of the day just closing; gives the orders for the next day's work, and adds what he can of general interest. In fact, makes a country newspaper out of himself, and reminds one of the scripture passages in regard to housetop proclamations. Their tradition is, that they were once governed by Montezuma, who commanded them to watch their sacred fire and keep it burning until his return, when he would build up his kingdom stronger than ever. You can also hear very pretty stories of the faithful followers of Montezuma, climbing at day-break to the house top to watch for

the coming Hero. But such Pueblos as I have chanced to meet driving their loaded donkeys to market, did not look as if they expected the old man back right away. They manufacture their own clothing and articles for domestic use, but excel in pottery, which is largely used all over New Mexico. It is a black ware, generally made of a vase shape. It will withstand the action of fire, and is used for all purposes for which we would use kettles. The jars of a larger size are made of the same general shape; large at the bottom, short and a vase-shaped mouth, and are used all through the country, by the Mexican girls, for carrying water on their heads, which they do without touching it with their hands. Money is very little used by them as they trade but slightly with outsiders; manufacture their own clothing and have but little use for goods from abroad. They are rapidly declining in population, as from their habits of inter-marriage, they are already small sized, and physically inferior to their former condition.

DANCING.

Of all ways of amusing themselves, the Mexican is never at a loss when there is a dance on hand. He is brought up to it; commences when he is a few years old, and understands it so thoroughly that no calling off is necessary. If you happen in a Mexican town at dusk and see a band of musicians promenading the square, playing as they go, follow them to their stopping place and you will find it is a long hall with earth floor. Along the sides are benches, and overhead are candle sticks made of wood. As the evening advances the dancers assemble. The four arms of the wooden chandelier have each a candle at its extremity, blazing away regardless of expense. At one end of the hall are the musicians, while in the corners and other out of the way places are old men, young men and boys, waiting for the women to come. They come directly with their shawls folded about their faces, so that you can scarcely tell the old lady

from the daughter that she guards. But as they take their seats on the benches, the shawls are pushed aside from their face and everything is ready for the dancing to begin. The band strikes up a familiar air; the occupants of the corners take their places on the floor and invite their lady partners to join them, in a decidedly off-hand manner. Some times merely by a nod; again, by touching her with the hat, which they have just removed from their heads. But no matter how they do it, they are never refused, and Mrs. Mexican lays aside her shawl, hands her half smoked cigarette to some neighbor to finish, and takes her place on the floor. Most likely it is a slow waltz, but in any case, the floor is kept full until two sets of candles are burnt out. Look along the line as they dance and see how much better the women are dressed than the men, for a Mexican will go ragged himself to be able to give some present to the woman he loves. There is a lady in a silk dress, she is Don Francisco's wife and the man dancing with her, with the ragged linen coat on, drives oxen in old Francisco's freight train. Everything democratic, you see. But the earth floor has become dry and must be sprinkled, and the dancers take seats a moment while some one, with a pail of water and wisp of straw, gives the floor a good dampening. Now that the dancing has commenced again, a little girl joins it. She is only four years old. It is her first dance and she is a little timid, but she makes no mistakes and everyone likes her. So when that waltz is over, a couple of admiring men lift her to their shoulders; the musicians take a place in front and they have a little triumphant march around the room. We might as well take a comfortable position in this broad window seat, brother American, and see this next dance out, for the whole town is here, and some from the next one; and as to girls, please remember that this is the only occasion when you can see them without that everlasting shawl.

They are dancing the quadrille now, and that one with the pink ribbon in her hair, and with the snug fitting button gaiters,

is one of those we met coming up from the creek barefooted, with the water jar on her head. There is snow on the ground, you know, but then she was saving the shoes for a dance. How solemn they all are; they never laugh at a dance. If you want to try dancing, and make the most ridiculous mistakes possible, they would keep their faces smooth. Please notice, too, that they don't wear low-necked dresses, neither do they encourage any little flirtation. There is a couple just taking their seats—no they don't—only she does, after he has helped her resume her shawl. That is his good bye, for he takes his place in the corner again with the rest of the masculine herd. See how polite they are to each other in their way! See the boy who has brought the light from the fire-place to the man with the old army overcoat on! He bought that overcoat at a government sale, and his clothes is all that he owns. He herds sheep for the boy's father, but he is an old man, so the boy stands with his head uncovered, while the man lights his cigarette. Look here, old boy, what are you studying about? You are not thinking of that polite juvenile at all. Oh! that is it? You think these women are good looking, and you don't know but it would do to marry that one that is so economical on shoe leather? Well I tell you it wouldn't do at all. She wouldn't be economical if she had an American for a husband. You know Charlie Roberts? I met him for the first time, a week ago, and got acquainted with him in five minutes, as all we Americans do—there are so few of us. His Mexican wife was in the room, and this is what he said: "Don't marry one of those things; I was fool enough to. I had \$1,500 a year ago, but it is all gone now. I have been buying things and she has been giving them away to her relations, and now I am broke; and if you can tell me where next week's grub is coming from it is more than I can do." And for fear you might conclude to do as Roberts did, I think we had better go home.

MEXICÁNS.

They are an institution and might as well be described now, for there are many thousands of them in Uncle Sam's dominion.

The male specimen, if he is poor, wears a blanket of home manufacture for a coat, a cheap hat, buckskin pantaloons, and moccasins complete his dress.

He was born a Catholic, but if you ask him for a reason for the faith that is within him, he replies with the "Qulne Sabe," or who knows, which he uses in all cases, when he is ignorant or in doubt; and one or the other of these conditions covers most of his life. If he can talk a little English, look out for him. If he cannot, he will treat you well and divide his last morsel of food with you if necessary.

He is not very fond of work, but when it is absolutely necessary to buy candles and pay the musicians for a dance, or buy whisky, you can rely on him for working as long as the necessity lasts.

He does not talk good Spanish; it is so mixed with the language of the Utes or Navajo, from which he is partially descended.

His richer neighbor, who owns the cattle in the vicinity, most likely can talk better, and write and read a little, although schools are so uncommon with them that all my attempts to give them any information in regard to Spain, or any country in Europe, were failures. For when they found that such places were across the sea, their minds refused to grasp more and they would tell me that that was enough.

A Mexican happened into a telegraph office. Its mysteries haunted him until we met one evening, and he ask me to explain them. I rashly thought it could be done and commenced a description of the way in which magnetism was developed by the acids and plates of the batteries. But he had never seen any sulphuric acid, zinc plates or magnet, and knew nothing of their

properties, and waived all further explanations by his conclusion that the devil was in it. But when any one of the lower classes is fortunate enough to acquire any education, they are very proud of it, and do not let an opportunity pass of exhibiting their accomplishments. A young man with a group of friends came to the house at which I was stopping, and handing me his hat, ask me to tell the company what was written on it. I happened to know his name and saw that the strange characters were intended for it, and without any hesitation told the audience that that was his name. This was a triumph for him, as he had brought his friends several miles, to prove by me, that he could write. No one of them could tell, as they could neither read nor write, themselves. After this happy disposal of the case, it occurred to him, of the hat, to arrange some business between us so that I should pay a friend of his some money, in case he completed a trade with him, which he expected to. But how am I to know, I asked, whether you trade or not? Will you send an order by him for the money? This was too much. He could write his name, but an order for money was too vast a thing. But he got out of the dilemma by telling me that his friend should wear his hat with his name on it, if the money was to be paid to him.

A Mexican woman, with hardly an exception, has black eyes and wears a long shawl over her head, with the ends brought around in front of the face, in such a manner as to leave only the eyes visible. With this arrangement the effect is very fine. A swarthy skin or ugly feature is hidden, while the glorious eyes sparkle at you in their beauty, from among the folds of the shawl.

She exists under difficulties. In cooking she is restricted, by circumstances, to such dishes as can be prepared at a fire-place, with a small kettle and a flat rock or a piece of sheet-iron, on which to bake cakes. Pies and puddings are unknown, except on great occasions. Besides the scarcity of cooking utensils, a

very small supply of food curbs any ambitious attempt to excel in cooking. Indeed, so insignificant is the whole stock of house-keeping utensils, that family divisions occur with alarming frequency. In that case account stock is soon taken; a sheepskin or two and an old kettle being each one's share.

When it comes to dress, the poorest ones even, are equal to the emergency; for when the presence of the musicians on the street announces the approach of a dance, every woman in town is busy with a judicious system of temporary swaps of clothing, the result of which is a triumphant display, at the dance, of a combination of dress entirely new to the wearer. And woman's taste for an appearance in a costume never seen before, is gratified without the expense of shopping.

COURTSHIP AND MARRIAGE.

A Mexican gets married under difficulties; it is likewise expensive.

Having attended dances from his youth up, he has an idea what girl he would like for a wife, but he is not at all sure of it, for he has had no earthly way of getting acquainted. It is true, he has played Jacob, and hung around the creek when the girls went down to get water; but then they always go in droves, with the old woman along besides. And so it happened that he never had the assurance to ask one for a drink of water, or try any other little plan to further his acquaintance on these occasions. Besides this he has sometimes seen them plastering the houses on the outside with mud. But there were more old women around. And if he had ever studied up a nice little plan to go over to his fair neighbors to borrow a peck measure, that he did not want, so as to see the girl that he did, the dogs were sure to bark at his approach, and the old folks had plenty of time to send the girl into the kitchen, and there she would stay until he had gone away with his old measure: for, it is not etiquette

for an unmarried woman to be in the room when a single man is present.

Notwithstanding all these drawbacks, however, he has picked out his girl and proceeds to ask for her.

Now he don't walk up to her, or any of the family, and make his request; but, he lays awake a night or two, studying how to make a success of it.

This asking is to be done by letter, and not from him directly; but the letter must be written for him by some friend of his, who is likely to have the most influence with her family. So when he has settled upon which of his friends will be most likely to make out the best case, he makes his wishes known to him and the negotiations commence.

This friend does his level best; puts in all he can, conscientiously, about the candidate's virtues, and if he hasn't many, why then he draws on his imagination for what he ought to have, and when this epistle, with his virtues nicely sandwiched with compliments to her and her family, had been sent, there comes a week or two of suspense. He hears from every one, that he has asked for the girl; but he has no intimation of what answer to expect. What is the girl doing all this time? Nothing. But the family are busy. They are having a general interchange of opinion as to the pros and cons in the case. I suppose she is consulted. But her opinion is not the weighty one, by any means. If he has offered sufficient inducements, (and sometimes it is bible way again, and he offers to work a certain time), his friend is informed of the favorable results, and a day is set for him to receive his wife. But the reception is only in name. He takes all the presents to the house that he can afford. There must be a good stock of dry goods included, for he is expected to furnish that part of the outfit. But he don't get the girl until on another occasion. A legal friend of mine had gone through these preliminary regulations; and, one day I was made aware of the approach of the marriage by a curious document.

in Spanish, that it took me some time to comprehend. At last I decided that it was meant for an invitation to the wedding, which was to come off on the next day.

The appointed hour found me on hand, but the wedding had already taken place and most of the company were merely present at the feast, and dance which followed. There were several courses of eatables, and none of them very elaborate. First came bread and coffee; next, boned chicken and "chili colorow," or red peper. After this delicacy was disposed of something else was brought on. You would call it bread pudding, except that it had onions in it. As it was, it was composed of hard-boiled eggs, custard, raisins, sliced onions, &c. This was too much; I withdrew from the festive board, knowing that nothing would follow except dancing.

FUNERALS.

Do you care to go to a *valoria*? a friend said one evening. What is that? I asked. Put a candle in your pocket and come and see, was the reply. With the candle pocketed I followed my companion up the hill to an humble dwelling at the top. As we entered we found the four sides of the room occupied by persons busy in recounting the virtues of their deceased friend, who lay upon the earth floor, surrounded by burning candles, which had been contributed by the persons entering the house. I added mine to the number and watched the proceedings awhile; but as they were very monotonous I adjourned.

The next day the funeral took place, without any unusual ceremony, except the piling of stones whenever the coffin bearers rested, on the way to the grave.

These stone piles are to be seen all over New Mexico, in the vicinity of church yards. They are supposed by many to indicate the spot where some one was murdered. This is a mistake, although similar stone piles are erected on the sites of murders.

BLACKSMITHS.

A Mexican blacksmith shop is a curiosity as well as his way of doing business. The bellows are very often made of two circular pieces of wood, about two feet in diameter. These are connected by the usual webbing of leather, resembling an overgrown accordion, when finished. Two of these are placed alongside the forge, and are worked by handles, so that the current of air from one shall enter the fire while the other is being filled.

On one occasion I wished some rods made, and went to the blacksmith shop for that purpose. A few days before I had listened to a burst of eloquence from him, on election day, in which he hurled back the charge with which he had been slandered, of having sold his vote for a peck of beans. I had considerable awe for the man who, besides being elected *Alcalde* on that eventful day, had soared above such base bribes as beans. It was with considerable trepidation, therefore, that I made my wishes known on the practical subject of iron rods. So, when I meekly told him that I would like the rods to be three feet and four inches long, I was partially prepared for the frown with which this information was received. I ought to have known this, thought I. Here is a great man—a learned man—hidden away in this lonely mountain gorge, who draws his inspiration from the eternal hills; and as the iron in his forge comes to the white heat, so his massive intellect evolves strong thoughts as he hammers the pliant metal to suit his will. But down comes my hero in the next five seconds. For he replied, "what is that to me? I have an office—feet and inches may do for carpenters, but I have nothing to do with them."

Here was a dilemma; and I asked him how I should show him the length I wished the rods to be made.

"All you have to do," said he, "is to hunt some sticks and cut them the same length you wish the rods to be made."

I left him with the necessary sticks and returned the next

day to find the rods spoiled, by being drawn out to a rude point on the end where the screw-thread was turned, giving about three inches of point, too small to catch the thread of the nut.

Of carpenters very little can be said; a hammer and hatchet are all that most of them use, while an ambitious one occasionally tries a jack-plane and foot adze.

WEAVING.

A Mexican woman cannot make as good a blanket as her Navajo neighbor. But, with a similar loom, she makes a rough, coarse, black and white article that does duty as a coat by day and blanket by night.

She spins the yarn for this, on the point of a long stemmed top, which she twirls in some bowl or plate, to keep it near her side as she sits upon the floor.

MOLASSES.

One other industry which suits a Mexican is the making of molasses, which they do, from the juice of their Mexican corn-stalks. They boil the stalks until most of the saccharine matter is imparted to the water, after which the stalks are placed in a rude press—generally a section of a hollow log placed upright, while some long timber forms the lever, a weight on the end of which causes the pressure, which presses the juice from the stalk.

There is so much sugar in the stalk of the Mexican corn that it seems to me to be well worth experimenting with by the Americans, especially as such a short season is required for its growth.

PRODUCTIONS.

The largest crop raised in New Mexico is wheat, which is cut with a sickle, very often with the point broken off, as the

Mexicans say it catches too much grain at once, if left the full length. Next comes corn, which is a small variety of different colors; no one color being preferable to another, as I can see; yet if a Mexican wishes to express disgust, he often exclaims:

"Oh! That is blue corn!"

It is all very strong grain, however, and matures in a very short time; instances being known where crops have ripened in eight weeks from time of planting.

Then follow beans, peas, onions and potatoes. Potatoes are very rarely raised, however. Beets are barely known; and I never saw, in two years of New Mexico life, a specimen of carrot, parsnip, radish or lettuce. They may be raised for the markets of some of the larger towns, but are not to be found in the country.

Tobacco is raised in small quantities, but is of a poor quality and all goes to smoke long before Christmas time; the supply for the rest of the year coming from the states.

DOGS.

Of domestic animals there is first the dog. The poorer the owner is, the more dogs he has. I am not a good judge of dogs, and if I were to buy a herd I should not know what color to select. These are mostly yellow. They generally have tails, and some that I had a sudden acquaintance with, I am very positive had teeth. If you come up to a group of Mexican houses, you won't see many of them at first. But they are there and come out in a hurry; some from out of the mud ovens, and the rest from the comfortable corners that they love. No one of them, however, is disposed to be rash and leave his comrades very far behind. So the foremost occasionally looks around to see if he is well supported before he dare bark again, or take the coveted nip at your heels. The feint of picking up a stone generally drives the whole crowd, though sometimes a pistol shot is nec-

essary. All this time the owner of the dogs is generally looking on and telling those inside the house how brave the dogs are, without ever offering to call them off. The production of the pistol generally rouses the proprietor to call his canines out of danger.

HOGS.

Next comes the hogs. There are not many of them, as they are so thin that tying a knot in their tails will not prevent them from crawling out of the cracks in the pen.

It becomes necessary to picket them out with log chains; the chain is worth more than the hog. A rope won't do, because he would soon chew it off. And, a Mexican does not think it is worth while to lay out the money that the chain and hog would cost, when the same food he eats would raise so many pups.

So it happens that interest in pork languishes. Native side meat is not quoted on change; and if you should be a dweller in New Mexico and want lard, why, pay your little 40 cents per pound, or bring a can all the way from St. Louis.

CATTLE.

The cattle of New Mexico are of a small breed. But little attempt is made to make butter and cheese, although both command high prices, but are saleable only in small lots.

A Mexican woman thinks she makes butter when she gathers it out of the churn, and wants 75 cents per pound for it with the buttermilk still in it. They rarely use it themselves and the few Americans in the country won't pay that price for that kind of butter.

So it happens that the cows generally run without being milked; the goats furnishing the milk which is used, part being made into cheese, which is a small irregular shaped article, as

it has had no pressure except the weight of a stone on the curd, as it was contained in a bag.

The reason for the high price of butter and cheese all through New Mexico and Colorado, lies mainly in the kind of cattle which have been kept. The Texas and Mexican cows having been raised for so many generations without being regularly milked, they give but little at a time; so it is generally found more profitable to keep up the old system and raise calves instead of making butter and cheese; especially when you take into consideration that there is plenty of free pasture for the growing calves and a scarcity of skilled labor for making butter and cheese.

HORSES.

The horses of the Mexicans are generally small and used for saddle animals. Although a Mexican rides a good ~~val~~, he is a poor horseman; uses his whip or enormous spurs incessantly, besides going through a great many unnecessary motions with his arms and legs, to urge the poor brute on, who often carry two, and sometimes three persons.

DONKEYS.

These odd looking brutes are a feature in every view of Mexican out-door life. One never tires of looking at them and studying their odd faces. An animal with such long ears is supposed to be stupid. But, he knows all about it.

I once bought one for \$20.00, to go on a mountain trip with. He was a veteran wood contractor. He and some of his comrades had carried wood to town, for which his owner had recieved 37 cents per load, for years. These loads were immense. The bundle of broken wood carried on each side of the donkey being four times the size of his body. This poor fellow had always looked so sorry about the business that I resolved a

change should come over the spirit of his dreams. Accordingly, on that day of new experiences, when I "packed" the donkey with my rifle, bacon, flour, cooking utensils, shovels, pick, axe, hatchet, &c., I resolved to be merciful to the beast and not draw the ropes so tight as they had been in the wood trade.



[A DONKEY PACKED.]

So, with the best of intentions, I laced up light and followed him along the trail, with the happy consciousness that I was a very kind-hearted fellow.

I was meditating establishing a branch Bergh society, to

prevent Mexicans tying the ropes so tight. It was so necessary, you see. And I viewed the load in front with still more complacency. But just then, it seemed to me, that that load was turning to one side. The next moment I was sure it was. And with no more warning the whole collection of baggage lay on the ground by the side of the donkey.

The next attempt was only a partial success; and it was only after several day's practice that I became an adept at packing a donkey.

They are wonderful fellows, too, to hunt out roads through difficult places. After traveling a little while they soon find what routes it is wished to follow. When an obstruction is reached they take the best way around it and then take the same course again, even if there is no path to go by.

They are very strong in the neck, so they are generally fastened by one foot, to the rope, when picketed for the night.

Their ordinary load is about 250 pounds, although I have often seen them carrying over 300 pounds.

On account of their small feet, they are very much afraid of venturing on icy or damp places, and a liberal application of the stick is necessary to make them go ahead. The amount of clubbing a donkey can endure is perfectly marvelous. My little fellow never missed a mouthful of grain to avoid the kicks he was getting, one dinner time, from a good sized mule.

RELIGION.

As has been said, a Mexican's religion is Catholicism. He is a Catholic because he was born one. But, he cannot talk with you and uphold his religion as an Irishman will; and although the form of their religion is the same, the practical working of it in New Mexico is very different from what I have ever seen anywhere else. Or rather, it hardly works at all, for it has no opposition to speak of. The result of it all is that

everything moves along quietly through a routine of church forms. What priests there are, mostly come from France. But they do not make themselves known through the back settlements, except on wedding, funeral and baptismal occasions. At these times there is a heavy fee coming, and they are on hand.

Occasionally society lapses from virtue to such an extent that several couples, in a neighborhood, have forgotten to get married. But, a trip of a priest through the vicinity generally arranges things tolerably straight again, as these delinquents are married at once, for the best fee they can be made to pay. And, as all those contemplating matrimony are married on the same visit of the priest, he is kept pretty busy regulating affairs.

PENITENTIES.

Near every large town may be seen a long adobe building, generally closed, while inside are large wooden crosses, made from the unhewn timber of the vicinity. They are of different sizes and weights, generally from twelve to fifteen feet in length and six or seven inches in diameter, and making a good load for the men who are to carry them.

Various secret midnight meetings are held during the year. No one is supposed to know who the members of these societies are and no public demonstration is made by the whole society until their anniversary day in the spring.

On this occasion the different penitenties assemble near the building, form a procession and carry the crosses through the neighboring valley. As they walk, with their faces covered with a mask, and their backs uncovered, the bystanders beat them with cactus bushes until the blood streams down their bodies.

Sometimes they resort to other modes of torture, the idea seeming to be to add as much as possible to their burdens. I have known three persons to die, from the effects of this self-inflicted torture, at one meeting; and this, too, only from one

small neighborhood. Individual members of the society torture themselves at other times, during the year, in various ways, such as lying down in front of the churches and begging the people, as they come out, to step on them, "For the Love of God." This they do to help the matter along.

I have endeavored to find out whether these societies of penitents are connected with the church; and, although one priest, with whom I conversed, denied it, yet everything looked like it, and I am forced to the conclusion that it is some kind of an outgrowth of their religion, and that it is responsible for it.

The Car of Juggernaut has long ceased to crush its victims; but here in a territory of the United States is an annual offering of lives to heathenism.

AMUSEMENTS.

Besides dancing the Mexican amuses himself with cock-fighting, which is conducted, I suppose, much as it is anywhere else—although I never saw anything of the kind. But, as you travel through New Mexico, you are continually noticing, in the corners of the rooms occupied by the family, a quiet-looking rooster sitting on a perch and occasionally casting his eye up to a nail in the wall, on which hang his steel spurs, which tells the uninitiated that he is a game-cock.

ST. JOHN'S DAY.

When this day comes around I fancy every rooster in New Mexico is despondent, for a curious game is to be performed that costs many of them their lives.

The men of the town provide themselves with a live chicken, and when mounted on horseback, ride toward each other, striving as they close up, to catch the chicken from the other one's grasp.

This barbarous contest continues until every one is tired and the chickens pretty thoroughly torn to pieces.

EVERY DAY LIFE.

The furniture of a Mexican house is very simple; so, too, is their way of living.

If you approach a house and wish for a meal or lodging, you will be welcomed, and invited to enter, in the most polite manner. "Pass in"—"enter gentlemen"—is the English of the most common imitation.

If you are a relative or particular friend of the family, the next thing on the programme is a species of hug—not a good square hug, as if you enjoyed it—but a rather formal affair, the hands of the parties being on each others shoulders. This thing is soon over with, and then comes a smoke all around.

The finer corn husks make the wrapping for the cigarette. These are always carried conveniently and are passed around, filled with fine tobacco, folded and lit, and soon the air is blue with smoke and vocal with the gossip which is being exchanged.

Perhaps some one has been elected to some church office and is going to give a dance in honor of the event, and the particulars of that are under discussion.

If you propose to stop to a meal and all night, and are an American, you will soon find that you have created quite an excitement. It rarely happens that one family of the poorer classes have all the requisites on hand for a good meal; so one child is dispatched one way to borrow some article; another in a different direction for something else; while the woman of the house curls down by the fire-place to get the supper.

There is a kind of cake they make of flour and water without shortening or yeast of any kind. These they work out as thin with their hands as it is possible to make them, and then fry them floating in lard. They are brittle and are very good.

As I was asked one evening what I would like for supper, I thought of these cakes, and said I would like some of them.

Everyone commenced laughing.

I was astonished, for they rarely laugh at mistakes. I asked them if they hadn't plenty of flour.

"Yes! But where shall we catch them?"

After having plenty of fun at my mistake, they explained, that by using a slightly different word, I had enquired for fried ghosts, for supper.

I never saw a woman sit at a table but once, and then it was in response to a remark that I made, that American women always sit at the table.

"Yes," said my host, "that's so. Come here," said he, to his wife and daughter; and without any more delay he had them sitting at the table with us. They were not used to it, but went through it very creditably, although I know they had much rather be eating at the fire-place as usual.

On one occasion I was camping near a house of considerable size. The large herd of sheep belonging to the owner told of wealth; and when I accepted his invitation to dinner I was surprised at his asking the loan of a knife and fork from my mess chest. But when we sat down to dinner, I was more surprised, for the table was covered with a new piece of Brussels carpeting. My knife and fork were reposing in solitary state on the carpeted top of the table, while mine host evidently intended to ladle his dinner with a broken handled spoon, which nestled close to the tin plate next to him.

While the women in the kitchen were dishing up the red peper, he asked me to name the price I thought he had paid for the carpet; adding, "I have fifty yards in the corner."

I made the nearest guess I could, when he told me the cost and said he wanted to put it down that afternoon.

What, I asked: on the dirt floor?

"Why not?" he replied.

Then followed a long discussion on the necessity of a board floor, a thing unknown to him; and with a long face he finally resigned himself to the inevitable expense that was to come.

The contemplation of a house with \$100 worth of carpet in one room, and not a knife or fork in the whole house, was so comical that I was constantly thinking of it; and that evening at my stopping place, a few miles down the valley, I told my host the story; forgetting, when I commenced, that I was talking to another Mexican, who would quite likely take offence at my reflection on his race. He joined in the laugh, however, but looked awkward enough at the table that evening, where one could see but little improvement in his stock of knives and forks, over that of his neighbor.

One is continually amused and perplexed by experiences similiar to the foregoing. Amused at the comical situation of things resulting from their attempts to copy American customs in some things, and neglecting to do it in others. Perplexed at their unwillingness to acquire the English language; or, to use it if they understand it, when all the time they know and acknowledge the superiority of the Americans to them, is owing to their education.

WOMEN'S WORK.

The work of the women, in addition to the housework common to her American sisters, consists in washing the wheat for the mill and in sifting the flour from the bran, on its return.

Often, too, they actually grind the grain by rubbing it between a large stationary stone and a long, slim one, which they hold in both hands, grinding the grain as it slides down the face of the large one, onto the flesh side of a sheepskin, spread to receive it.

The inevitable sheepskin serves for a variety of purposes. On it the ashes are swept from the fire-place; vegetables are

dried on it; the occupants of the house sit on by day and sleep on them by night, if too poor to own a woolen mattress, as is sometimes the case.

Besides this the women plaster the houses with mud and whitewash them with plaster of Paris.

Ironing does not trouble them much. No complications of ruffle, scollop, &c., perplex their brain.

A sewing machine is to them an unknown thing. I was once astonished at a Mexican who thought he knew it all. Taking a copy of a Scientific American from my hand, and informing his wondering wife that a picture of a velocipede, that he showed her, was that of a sewing machine. Neither of them knew any better, and remembering my attempt to explain the telegraph, I thought they might as well remain in ignorance.

The time of the men is largely consumed in idleness. When the farming work does not press them, and they are short of money, they often work for some one, driving cattle in the ox trains of the country, which are used to bring the freight from the terminus of the railroad.

Goods are transported very cheaply by these trains, as the only cost is the wages of the drivers and repairs on the wagons.

Each wagon will carry from four to five tons, and is drawn by several yokes of cattle. Spare wagon tongues, water barrels, and extra ox chains are slung underneath, while a drove of cattle accompany the train to take their turn at wearing the yoke.

The progress of the train is very slow, but as they make several short drives during the twenty-four hours, considerable progress is made in the aggregate.

If you meet a train in motion, you will find every driver hard at work swinging those immense whips, whose crack is like the report of a pistol, and the blows from which make the poor brutes cringe every time; and then the swearing is fearful.

These Mexicans use every cuss word known to them in their language, and then draw on the American and use that up.

When the train is at rest you will see the drivers sitting by their fires cooking their meals and smoking their cigarettes, while wrapped in their blankets. Their passion for smoking is universal. They will awake up in the night and console themselves with a smoke.

On these occasions you will see the faint glimmer from their cigarettes, brighten like a fire-fly in its flight, at every inhalation of their breath.

SWINDLES.

The few government posts in New Mexico are the centre of innumerable swindles on the government. There is no end to the original plans set on foot to get a hand in Uncle Sam's pocket.

On one occasion, before the railroad crossed the plains, a worthy individual was entrusted with a fine lot of cavalry horses, to take to a post in New Mexico.

He gave his receipts for the number, but commenced swapping and trading as soon as he started out. By swapping one good horse for several poor ones, he increased the number so that he could then sell more good horses, for cash, without going below the number he had receipted for.

He kept up this little game all the way to the post, when he turned in his herd all right, ACCORDING TO THE PAPER. But a sorry looking lot of horses they were.

The officer in charge of the post could do nothing but receive them, as he was not supposed to know what he started with. But he remarked that he didn't think it was very likely the transportation officer would have any more horses to take across the country—and he didn't.

Another story is going the rounds of a paymaster who came to grief through the instrumentality of those little pieces of pasteboard—green on one side and spots on the other. It troubled him. His safe was nearly empty; and, how to pay off

the troops, under the circumstances, was a puzzling thing. But a bright idea came to his aid, and he proceeded to put it into execution.

Accordingly, the next night he took the safe from the office and out onto the prairie; blew open the door and scattered things around generally. He then returned to the office and made a hole in the wall, through which the safe was supposed to be taken.

In the morning he went to the commander of the post with the astounding intelligence that the safe was robbed, and took that officer to the scene of the trouble, so that he might prepare a document for the government, which should set forth the circumstances and clear him.

The general shook his head and smiled as he said: "Well. I'll sign the papers this time, but when you try it again, make the hole in the wall larger than the safe. It will make the whole thing look so much more reasonable, you know."

Take a hay contract for instance. There is not a step in the whole business but what a swindle may, and in many instances does, come in.

When, under a system of straw bids, the successful party obtains the contract, he proceeds to deliver the hay; the party weighing giving a voucher for more than he receives.

The under officers distribute less to the horses than the rations call for, and sells the difference.

Lumber, grain and other contracts are manipulated in the same manner.

A wagon-master gives his receipt for so many tents, wagon covers, mules, &c., amounting to several thousand dollars worth of property.

He then commences to sell and swap, putting the difference in his pocket, and being careful always to have some pieces of tents, &c., on hand with which to make his returns good; the pieces to be all that remains of the original article.

DURANGO.

This town lies in Colorado, but so near the line that no doubt much of its trade will come from New Mexico. It is a large and flourishing town, and is growing very rapidly. It is the natural supply point for a very large mining country. It is on a branch of the Rio Grande Railroad, and no doubt will be a terminus for that road in that direction for some time to come. It has an abundance of coal in its vicinity; some varieties that coke, and some that do not. In this supply of coal it is peculiarly fortunate. The importance of an abundant supply of cheap fuel in a mining district cannot be overestimated. When it is remembered that Pittsburg owes her prominence to the accident of coal and iron being close together, it is easy to see that if such wealth can be shaped from those circumstances, where the market of the product is limited by its weight to a distribution over only a few hundred miles of territory, that a manufacture of silver bullion, with its world-wide market, under such favorable circumstances, cannot fail to enrich the country in which it is carried on. Durango has splendid water. It is entirely free from any trace of alkali, and comes from the neighboring mountains fresh from the snow banks and free from any foreign substances whatever. The following extract from one of our dailies will give still more information on the subject:

DURANGO.

"In southwestern Colorado, near the New Mexican line, at the confluence of Animas River and Lightner Creek, is situated the new and thriving town of Durango. Not more than four months ago there were to be seen only a few scattering houses, while at the present writing a busy and enterprising city of more than a thousand population has sprung up—as in a night. Manufactories, smelters, saw mills and many first-class business houses are now established and doing a rushing business.

THE NATURAL ADVANTAGES

of Durango are such as to ensure a rapid and permanent growth in population and commercial importance. No town in the State surpasses this in point of location, climate or mineral wealth.

THE ALTITUDE

is favorable—being only about 800 feet higher than Denver, and is over 4,000 feet lower than Leadville—both as regards residence and agriculture, a feature that commends it to the hundreds who are now going there. Many of our mining camps are situated at so high an elevation that they are unfavorable to health and longevity, but, at Durango, this objection cannot be counted in the list of drawbacks. The southern location of the town and La Platte County in general assures a

MILD AND GENIAL CLIMATE

particularly adapted to the rapid and early growth of vegetation and the prosecution of out-door work till late in the fall. Being situated in the Animas Valley the town is sheltered from the cold winds peculiar to many other portions of the State. The high ranges of mountains on the northwest and east rising six thousand feet above the surrounding country, ward off the prevailing cold currents that otherwise would sweep the valley; consequently southwesterly winds are the only ones that prevail, and these are tempered by the warm climate through which they pass. As a winter camp Durango is all that could be desired.

THE MINERAL WEALTH

tributary and in the immediate vicinity of Durango is very rich. The mountains are filled with mineral of the true fissure veins. The ore is not of a very high grade but is found in unlimited and seemingly inexhaustible quantities.

“Rico, Silverton, Animas Forks, Eureka, Lake City, Ruby and many other camps of equal importance are all tributary to Durango, and the establishment of the present smelters, of which we give a sketch further on, is only one of a dozen that

will doubtless have to be erected within the next eighteen months. The character of the ore at and near Durango is such as to guarantee a permanent and rapid growth to the city, and a large and safe return for the capital invested.

"The gold and silver, from the camps above named, will naturally come to Durango to be smelted, and as fields of inexhaustible

BEDS OF FINE COAL

are found in the immediate vicinity of the town, that great item so important to the smelters will be insured.

"The quality of the coal is said to be of the best, for steam, smelting and coking purposes; the vast supply can be realized to some extent by a knowledge of the fact, that the seam of coal stretching for miles is said to be from seventy-five to ninety feet in thickness. From this it will be seen that every essential feature necessary to smelting purposes is at hand ready for use; including

THE PUREST OF WATER.

The Animas furnishes this in quantities sufficient for all purposes for which water is needed.

"The city can always be supplied with pure drinking water, and a copious supply will always be at hand for smelting, manufacturing and irrigating purposes.

THE TIMBER SUPPLY

would seem to be adequate, for a number of years at least. The pine in this section is of good quality, large size and accessible.

"Four saw mills have recently been set up in these forests, and a lively competition will soon begin between native and Chicago or Michigan lumber. The pine in La Plata County, and tributary to Durango, is pronounced to be the best west of the Missouri. The

AGRICULTURAL FACILITIES

are not surpassed anywhere. The Animas, Los Pinos, Florida, La Plata, Mancos, Dolores and San Juan valleys, each have cer-

tain crops, while all of them have more or less extent of rich fertile soil. We have not space to individualize each of the above valleys, but will give the number of acres improved and worked, together with the value of improvements, yield of crops, &c., taken from the last State returns.

"The number of acres improved—4,520; the value of improvements—\$60,154.00.

"The wheat crop of last year yielded in the neighborhood of about 50,000 bushels, and the hay cut was something over 1,500 tons.

"It must be remembered that the acreage under cultivation is yet only one twenty-fifth of the available lands suitable for ranches.

"There is doubtless not less than 100,000 acres of well watered and valuable lands, ready to yield bountiful crops to those taking possession.

"Fruit can be grown to advantage and profit, and small fruits especially would pay large returns. Both the sweet and Irish potato can be grown easily in most sections, and the flavor and quality is excellent. This country offers unusual advantages, both as regards soil and climate, for the agriculturist and stockman.

"Among the many

NEW ENTERPRISES

recently started in Durango is the smelting works, now in process of construction. This institution is being erected by the New York and San Juan Smelting Company. The works cover a space of 100x150 feet, and is situated on the hillside at the mouth of Lightner's Creek.

"The stacks are to be of fifty tons capacity, with roasters in proportion, open blast system will be employed, and water jackets used.

"The buildings are to be built entirely of brick, with stone trimmings. The smoke stack will be one hundred and fifty feet

in high and fifteen feet square at base. The company will have their offices in a neat brick building of about 32x50 feet, divided into four rooms, to be used as follows: general business office, manager's office, assay office and laboratory.

"Messrs. Meyers & West have a large livery and sale stable, 40x75 feet.

"Messrs. Adams & Bayly have built a fine hardware store, 25x75 feet.

"Newman & Chestnut are the proprietors of an elegant drug supply store, 25x100 feet.

"There are at least twelve or fifteen other first-class houses which we have not space to enumerate; from the above facts enough can be seen to illustrate the growth, enterprise and importance of Durango. Since January 1, 1881, there have been three newspapers started; one daily and weekly, published by the Durango Publishing Co., and a weekly published by Engley & Reid, all being fair specimens of journalism. The former two, called the Durango Record, daily and weekly, are edited by a lady of acknowledged ability and enterprise. The copies of this paper sent to us, both daily and weekly, are gotten up in a style that would do credit to any town in the State.

"Rev. C. M. Hodge, an Episcopal clergyman, has established a church in the shape of the dining room of the Delmonico Hotel. He delivered his first sermon two Sundays ago to a goodly number of people, and arrangements will soon be made to build a church on the lots reserved by the town company for church purposes. This company, by the way, offer to any and all church denominations building sites free of cost. This is a piece of liberality seldom met with in towns with prospects like Durango. Mr. Hodge is well liked, and will no doubt do much towards establishing a good code of morals.

"Providence seems to have furnished all the elements necessary to the establishment of a thriving manufacturing and mining centre, as well as providing as good agricultural and pas-

toral facilities as can be found elsewhere in the State. A mild climate, mineral wealth of untold value—with all the coal and water supply necessary to its successful operation—together with a moderate altitude, unexcelled agricultural country, and timber in great abundance, ready for the saw mill, contractor and manufacturer. All this with the Denver and Rio Grande Railway—



the greatest narrow gauge railroad in the world—furnishing rapid and adequate transportation to and from all parts of the East and West, is at the disposal of Durango. This is its present, what the future may unfold in developing its untold riches can only be conjectured, but an ordinary mind cannot fail to picture for this city, a rapid and permanent growth.

"HOW TO PROSPECT."

The following, from "Blake's Hand-Book of Colorado," will be useful to those unacquainted with prospecting:

"An old miner and prospector gives us the following rules for the discovery of mines in mountain districts:

1. "Examine the gravel and boulders of the mountain streams, and note carefully the structure and character of the gravel wash. This will reveal the geological formations that are intersected by the stream. Try the sands at the head of the gravel bars for free gold, or for any crystalized minerals. If the structure of the quartz boulders or other vein stones are favorable, go up the stream until the geological zone is found that has produced the quartz or other metal-bearing minerals. Then follow the supposed metal-bearing zone on its line of strike, and make especially careful examinations wherever eruptive dykes are found intersecting the formation.

2. "When a lode or vein is found, note carefully its relation to the country rock, especially any differences in the opposite walls of the vein. Then follow it on the line of outcrop, and note carefully those points where the best ores are seen, so as to determine the position of the best ore chutes before making any location on the lode.

3. "The first work should consist of shallow cuts across the lode at intervals of 50 to 100 feet, or if the vein is small and partially covered by soil and debris, a trench along the line of

outcrop is preferable. If the surface tracing is satisfactory, and the true line of strike has been determined, then survey your claim and stake off the boundaries according to the requirements of the United States laws.

4. "The work of exploring the vein under ground is the next thing in order. To do this intelligently, you must select that point on the line of outcrop where the best ore is found, then sink a shaft on the lode following the angle of dip, keeping both foot wall and hanging wall exposed if possible. If the lode is too wide for this to be done, then follow the best ore streak of the vein itself, and at every fifty feet in depth make cross cuts to the walls of the vein.

5. "After 100 feet deep has been reached, run levels each way from the shaft on the line of the vein in order to determine the extent or spread of the ore chute or chimney on the horizontal line. When the limit of the ore body on the horizontal line has been ascertained then sink 100 feet more and drift right and left as before. If more than one chimney of ore is found on the line of the vein, a shaft should be sunk on it, and drifts run as above stated, being careful to confine all the exploring work within the walls of the vein itself.

6. "When enough has been done to prove the character, size and quality of the vein, it will then be time to determine the position, character and extent of the "dead work" necessary to work the mine to the deep. These questions should be settled by careful surveys made in the light of all the local facts and surroundings, such as geological structure of the country rock, the probable amount of water to be raised, the lowest point of drainage by adit or level, and the most convenient point for delivery of the ores to the surface, etc.

"The last part of the preliminary exploration of any mine is to determine, by actual tests, what are the best methods of reduction, and the extent and kind of reduction works needed, etc., etc.

7. "After all these preliminary facts have been thoroughly ascertained and clearly defined, the unavoidable risks of mining will have been fully met and overcome. All subsequent operations are simply matters of skill and business management, and the capitalizing of the mine becomes a mere matter of business detail.

"The requirements are as follows:

1. "The preliminary exploration must have ore enough cut and under-run, or otherwise exposed, to give at least two years' work for reduction work of an extent sufficient for the annual average out-put of ore.

2. "The reduction works must be suited for the best treatment of the ore.

3. "The exploration of the mine must be pushed ahead of the extraction of ore, so as to expose at least one ton of ore in new ground for every ton extricated from the previously explored ground.

4. "Before erecting reduction works, the ore exposed in the mine should be so thoroughly tested as to guarantee a net profit sufficient to pay the whole cost of such works.

5. "The mine being well opened, and the reduction works, or plant, established, the general success of the enterprise must depend upon the efficiency of the general business management."

THE LEADVILLE ORES.

Professor Henrich says: "The galena ores of Leadville consist of hard and soft carbonates of lead and streaks of galena. As a general rule, the soft, sandy carbonates run highest in silver and the hard carbonates lowest, while the galena seems to range between them in its percentage of silver. Silica occurs in all of these ores. In the galena it occurs as quartz crystals. As a general rule, the galena ore is lowest in its percentage of silica and highest in lead, while in silver it runs from thirty to

a few hundred ounces to the ton. Highest in silica are the soft, sandy carbonates of these ore beds, the silver ore par excellence of this district. The sandy carbonates carry a small percentage of lead and a few ounces of silver to the ton. The siliceous carbonates of lead carry over sixty per cent. of lead and hundreds of ounces of silver to the ton."

TO ASSAY CARBONATES.

"To assay carbonate of silver and lead, take the mineral or quartz, pulverize it, put it in a crucible or common clay pipe, put in as much common salt as mineral; let it come to a boil. When it cools the silver and lead will be in the bottom, silver the lowest. To separate the lead from the silver put it in a bone dust cup and melt; the lead will absorb into the cup, leaving the silver and gold. To separate the latter, boil it in nitric acid and this will leave the gold.

PROSPECTING.

Work, partner! dig down thro' the slide,
For just below, the Gold may hide.
Now, hold the drill, we'll make it ring;
For here in the mountain Muscle is King.

Put in the powder—tamp it down—
'T will awake the echos in mountain and town.
Now it goes off, with a sullen roar,
And shows us some of the precious ore.

MINING LAWS OF NEW MEXICO.

The mining laws of New Mexico are simpler than those of any other State or Territory in the Union. By them only one record is necessary. If the claim is filed in the recorder's office of the county in which the property is situated the title is perfect, and to learn all about the claims in a county a man has but to go to the recorder's office.

GENERAL LAWS OF 1876; CHAPTER XXXVIII.

AN ACT TO REGULATE THE MANNER OF LOCATING MINING CLAIMS AND FOR OTHER PURPOSES.

CONTENTS.

- SEC. 1. Location—bounds to be marked; notice of name of locator; make record in three months.
- SEC. 2. Record books must be provided.
- SEC. 3. Value of labor on mining claims defined.
- SEC. 4. Locations heretofore made, there being no adverse claim, may file claim within six months.
- SEC. 5. Ejectment in mining claims and real estate.
- SEC. 6. Repeals former acts.

Be it enacted by the Legislative Assembly of the Territory of New Mexico :

SEC. 1. That any person or persons desiring to locate a mining claim upon a vein or lode of quartz or other rock in place bearing gold, silver, cinnabar, lead, tin, copper or other valuable deposit, must distinctly mark the location on the ground

so that its boundaries may be readily traced; and post in some conspicuous place on such location, a notice in writing stating thereon the name or names of the locator or locators, his or their intention to locate the mining claim, giving a description thereof, by reference to some natural object or permanent monument as will identify the claim; and also within three months after posting such notice, cause to be recorded a copy thereof in the office of the recorder of the county in which the notice is posted; and provided no other record of such notice shall be necessary.

SEC. 2. In order to carry out the intent of the preceding section, it is hereby made the duty of the probate judges of the several counties of this Territory, and they are hereby required to provide at the expense of their respective counties such book or books as may be necessary and suitable in which to enter the record hereinbefore provided for. The fees for recording such notices shall be ten cents for every one hundred words.

SEC. 3. That in estimating the worth of labor required to be performed upon any mining claim, to hold the same by the laws of the United States, in the regulation of mines, the value of a day's labor is hereby fixed at the sum of four dollars: Provided, however, That in the sense of this statute, eight hours of labor actually performed upon the mining claim shall constitute a day's labor.

SEC. 4. All locations hereto made in good faith, to which there shall be no adverse claims, the certificate of which locations have been or may be filed for record and recorded in the recorder's office of the county where the location is made within six month after the passage of this act, are hereby confirmed and made valid. But where there may appear to be any such adverse claim, the said locations shall be held to be the property of the person having the superior title or claim, according to the laws in force at the time of the making of the said locations.

SEC. 5. An action of ejectment will lie for the recovery of the possession of a mining claim, as well also of any real estate, where the party suing has been wrongfully ousted from the possession thereof, and the possession wrongfully detained.

SEC. 6. That "an act concerning mining claims," approved January 18th, 1865, and an act amendatory thereof, approved January 3d, 1866; also, an act entitled an act to amend certain acts concerning mining claims in the Territory of New Mexico, approved January 1st, 1872; be and the same are hereby repeal-

ed: Provided, That no locations completed or commenced under said acts shall be invalidated or in any wise affected by such repeal.

SEC. 7. That this act shall take effect and be in full force from and after its passage.

Approved January 11, 1876.

DICTIONARY OF MINING TERMS.

The following are the principal terms in common use among miners.

ADIT—A level, a horizontal drift or passage from the surface into a mine.

ALLUVIUM—A deposit of loose gravel between the superficial covering of vegetable mould and subjacent rock.

AMALGAN—Gold or silver combined with quicksilver.

ARASTRA—(Mexican) — A circular combination in which ore is ground to powder by attrition to heavy stones.

ASSAYING—Finding the percentage of a given metal in ore or bullion.

ASSESSMENT—Amount levied on capital stock.

BARREN CONTACT—A contact vein, or a place in the contact vein, which has no mineral.

BASE BULLION—Precious metals contained in lead.

BED ROCK—The formation underlying pay dirt.

BLENDE—An ore of zinc, consisting of zinc and sulphur.

BLIND LODE—A lode having no outcrop.

BLOSSOM ROCK—Float ore, found upon the surface or near where lodes or ledges outcrop and from which they have become detached.

BONANZA—Fair weather; a mine is said to en bonanza when it is yielding a profit. It is a Spanish term meaning good luck, and is often used to mean a large body of ore.

BREASTING ORE—Taking ore from the face, breast or end of a tunnel.

- BULLION**—Precious metals, gold and silver, not coined.
- CAGE**—The elevator used for hoisting and lowering the ore cars, men and materials of a mine.
- CAP ROCK**—Formation overlaying the ore or vein stone.
- CARBONATE**—A geological formation which carries silver ore, and runs from 5 to 75 per cent. of lead—whence its name—and the rest, dirt, gravel, sand, arsenic, sometimes a little gold and other minerals. It varies in appearance from ordinary wet soil to hard, glistening rock.
- CARBONIFEROUS**—Containing coal.
- CLAIM**—A piece of land twenty-five to three hundred feet wide and fifteen hundred feet long, which the government sells to the man who finds mineral within its limits.
- CLORIDES**—A compound of chlorine and silver.
- CHUTE**—An incline channel through which ore slides.
- CONGLOMERATE**—Pudding stone, composed of gravel and pebbles cemented together.
- CONTACT**—A touching, meeting or junction of two different kinds of rock, or porphyry and slate.
- CONTACT VEIN**—A vein along the contact plane, or between two dissimilar rock masses.
- CREVICE**—A narrow opening, resulting from a split or crack; a fissure.
- CRIBBING**—A timber or plank lining of a shaft; the confining of a wall-rock.
- CORD OF ORE**—128 cubic feet of broken ore; about seven tons in quartz rock.
- COUNTRY ROCK**—Rock on either side of a lode or ledge, usually barren—the permanent rock, enclosing a vein.
- CROPPINGS**—The rock that appears on the surface indicating the presence of a lode.
- CROSS CUT**—A level driven across the course of a vein.
- CUPRIFEROUS**—Containing copper.
- DEBRIS**—Sediment from mines.
- DENUATION**—Rocks laid bare by running water or other agencies.
- DEPOSIT**—A body of ore distinct from a ledge.

DIGGINGS—Name applied to placers being worked.

DILUVIUM—A deposit of superficial sand, loam, pebbles, gravel, etc.

DIP—The slope, pitch or angle, which a vein makes with the plane of the horizon.

DRIFT—A horizontal passage underground.

DUMP—The pile of ore or debris taken from mines, or tailings from sluicing.

END LINES—The lines bounding the ends of claims.

FACE—End of level or tunnel against the ore or rock.

FATHOM—Six feet square on the vein.

FEEDER—A small vein joining a larger one.

FISSURE VEIN—A fissure or crack in the earth's crust filled with mineral matter. The two walls are always of the same geological formation.

FLOAT—Loose rock or isolated masses of ore, or ore detached from the original formation.

FLUX—The flow of the ore in the furnace of the smelter. To "flux" mineral is to get it so it will melt and run. It is obtained by adding to the ore certain proportions of other minerals, as of coke, coal or iron.

FLUME—Boxing or piping for conveying water.

FOOT-WALL—The layer of rock immediately under the vein.

FORFEITURE—A failure to comply with the laws, prescribing the quantity of work.

FREE GOLD—Gold easily separated from the quartz or dirt.

GALENA—Lead ore; sulphur and lead.

GANGUE—The substance inclosing and accompanying the ore in a vein.

GASH VEIN—A vein wide above and narrow below.

GEODE—A cavity studded around with crystals or mineral matter; a rounded stone containing such a cavity.

GULCH—A ravine.

GRIZZLEY—Bars set in a flume to strain out the large stones used in hydraulic mining.

HANGING WALL—The layer of rock or wall over a lode.

HARD CARBONATE—Carbonate ore so hard that it has to be blasted out, or picked out with much difficulty. It is a mineral, the iron and lead of which are but little oxydized and carbonated by contact with the lime.

HEADING—The vein above the drift.

HEADINGS—In placer mining, the mass or gravel above the head of sluice.

HIGH GRADE ORE—See Low Grade Ore.

HORSE—A mass of rock matter occurring in or between the branches of a vein.

INCH OF WATER—About two and a half cubic feet per minute, the water that will run out of an opening one inch square, or section under head of six inches.

INCLINE—A slanting shaft.

IN PLACE—A mineral is "in place" when it is where it geologically belongs. Mineral in the carbonate vein is "in place," but mineral found lying loose on the mountain side, in large rocks, for example, or lodged in the porphyry under ground, is not "in place." A man may strike mineral, but if it is not "in place" he is apt to be deceived as to the extent of his discovery.

JUMPING A CLAIM—Relocating a claim on which the required work has been done.

LEVEL—A tunnel cut on the vein from main tunnel. A drift.

LEDGE—A lode or vein.

LITTLE GIANT—A movable nozzle attached to hydraulic pipes.

LOCATE—To establish the possessory right to a mining claim; the property secured being designated "claim" or "location."

LODE—Justice Field, of the United States supreme court, has defined it to be any zone or belt of mineralized rock lying within the boundaries clearly separating it from the neighboring rock. It includes all deposits of mineral found through a mineralized zone or belt, coming from the same source, impressed with the same forms, and appearing to to have been created by the same process.

LOW GRADE ORE—Ore which runs below twenty ounces of silver to the ton, 50 per cent. of the ton being lead. Ore which runs more silver with 50 or more per cent. of lead is "high

grade" ore, yet a high per cent. of lead is necessary to make it high grade ore. For example, ore with one hundred ounces of silver to the ton, but no lead, would rank low grade, as the smelting would cost so much as to leave little profit to the miner.

MILL RUN—A test of quality of ore after reduction.

OUTCROP—That portion of a vein appearing at the surface.

PAN OR PANNING—Usually to wash the dirt from the free gold with a pan; the pan resembles an ordinary milk-pan.

PATCH—A small placer claim.

PETERING—Ore giving out.

PILGRIM—Fresh arrival from the East or the "States."

PITCH—The same as dip.

PIPING—Washing gravel in a hydraulic claim by discharging water through a nozzle.

PLACER—A gravelly place where gold is found; includes all forms of mineral deposits excepting veins in place.

POCKET—A rich spot in a vein or deposit. Sometimes an entire claim contains but one or two pockets, which makes it less desirable.

PORPHYRY—A rock consisting of a compact base, usually feldspethic, through which crystals of feldspar are disseminated.

PRIMARY OR PRIMITIVE ROCK—Consists of the various kinds of slate, quartz, serpentins, granite, and gneiss; they are the lowest group of rocks, are irregularly crystallized, and contain a few animal relics.

PROSPECT—The difference between a mine and a prospect, though entirely clear to the miner, is but vaguely comprehended by those unfamiliar. For the advisement of the latter the following examples are given, with mining idioms. To begin with, there are, in Colorado, at least three distinct classes of mines and prospects. First, and preponderant at the present time, "true fissure" veins, abundantly illustrated in the counties of Gilpin, Clear Creek, Boulder, Park and in the San Juan mountains. Second, the mineral deposits in horizontal strata, as in Mounts Lincoln and Bross; and third, the carbonate formations about Leadville, in the Dolores and Gunnison districts, and in Summit county, along Ten-Mile and the Eagle river. The true fissure pene-

trates the earth crust vertically, or at various angles from ten to forty or fifty degrees, and is a vein of mineral "in place," that is to say, in a fixed position, and, according to the accepted theory, practically inexhaustible. The carbonate formations are, as a rule, horizontal deposits in contact veins between two distinctive geological formations—as porphyry and lime stone. A mine as distinguished from a mere prospect, is something which has produced, and is capable of producing valuable material, demonstrated not by a shaft alone, but by levels, stopes, adits or drifts along the vein, developing the strength and character of the mineral body it contains. Whether the shaft be fifty or five hundred feet deep, it is not a mine in the legitimate sense, until these developments have occurred, and its value thus established. The shaft is a form of prospecting. A tunnel on the vein, instead of by shafting, is of the same nature. The levels and stopes constitute the development from which the profits are derived. A shaft rarely produces sufficient ore to pay for the cost of sinking, and it is the central point from which the explorations are conducted. A fissure prospect is a surface excavation which uncovers the vein. It cannot be lawfully claimed as a location until the vein is exposed and its walls defined. It does not, as in the carbonate fields, acquire the slightest prestige or value as a prospect from its proximity in parallel line to noted producers. It must rest upon its own merits solely, regardless of the treasures on either side of it, and its owner must rely solely upon development for the demonstration of its value. A carbonate prospect, on the contrary, derives both prestige and value from its relation to surrounding claims in which large bodies of rich mineral have been exposed. Vast sums have been invested in this class of ventures. Many of them will prove extra hazardous, but a very large number will undoubtedly return abundant harvests in good time. Hundreds are taking the chances, and in the results lie the future of the carbonate camps.

PROSPECTING—Hunting for mineral lodes or placers.

PULP—Pulverized ore in the lixiviation process.

REDUCING—Separating from foreign substances; the reduction of ores consists in extricating from them the metals they contain.

SLATING A MINE—Placing mineral or ore in barren places to swindle.

SHAFT—A vertical or incline excavation for purposes of prospecting or working mines.

SIDE LINES—The lines which bound the sides of a claim.

SLAG—Scum, dross, the excrement of a metal; vitrified cinders; waste from smelters.

SLIMES—The finest of the crushed ore and gangue from mills.

SLUICES—Boxes or troughs through which gold-bearing gravel is washed.

SMELTING—Reducing ores in furnaces to metals.

SOFT CARBONATE—Silver-bearing mineral so soft that it can be readily taken out with a pick and shovel. It is usually sand impregnated with mineral, the mineral having been carbonated and oxydized. Soft carbonates are usually richer in silver than hard carbonates.

STAMPS—Machines for crushing ores.

STOPE—A body or column of mineral left by running drifts about it.

STOPING—The act of breaking down a stope and excavating it with a pick.

STRATA—A series of beds of rock.

STULL—Platforms of timbers between levels for strengthening the mine by supporting the walls, and for storing ore and depositing wall rock and waste material upon.

STULL TIMBERS—The large timbers placed across the vein or lode from one wall to another, to support the lagging upon which the ore or waste is placed.

STRIKE—A find; a valuable mineral development made in an unexpected manner.

SULPHURET—Combination of sulphur with a metallic, earthy or alkaline base.

SUMP OR SUMP—A pit sunken at the bottom of a mine to collect the water. It may be the bottom of the shaft.

SUPERFICIAL DEPOSITS—Are composed of such metals and ores as lie on or near the surface, intermixed with soil, sand gravel, etc.; they are also called washings or stream works, these metals and ores being gathered by washing with water,

much gold, all platina, and some tin and cinnabar, are collected in this manner.

TAILINGS—The auriferous earth that has been washed and deprived of the greater portion of the gold it contained.

TUNNEL—A level, driven at right angles to the vein.

VEIN—Aggregations of mineral matter in fissures of rocks.

WALLS—The sides next to the lode.

WASH—The first geological formation, being composed of earth, sand, gravel, and other minerals "washed" down from the mountains during a long series of ages.

WHIM—A machine for raising ores and refuse.

WINZE—A shaft sunk from one level to the other.

STAGE LINES OF NEW MEXICO.

STAGE LINES FROM LAS VEGAS.

Stages leave Las Vegas for Las Cruces, going via Anton Chico, Gallinas Springs, Santa Rosa, Puerto de Luna, Ft. Sumner, Rosewell, Lincoln, Ft. Stanton, South Fork and Tularosa.

The fare to Las Cruces is \$44, and the way fare is ten cents a mile. Stages leave daily also for Vinita, going by La Liendre, Chaperito, Gallinas, Cabra, La Cinta, San Hilario and Ft. Bascom. From Ft. Bascom a daily stage leaves for Ft. Elliott.

STAGE LINES FROM SANTA FE.

There are at present two stage lines from Santa Fe. One, the Overland Mail and Express company, runs a daily buckboard for Conejos, Colo., connecting with the Denver and Rio Grande road for Alamosa. The fare to Alamosa is \$21; fifty pounds of baggage are allowed, and seven cents per pound is charged for freight to Conejos. The distance to Conejos is one hundred and eleven miles, and to Alamosa one hundred and forty-two. The stages of this line pass the Ojo Caliente springs.

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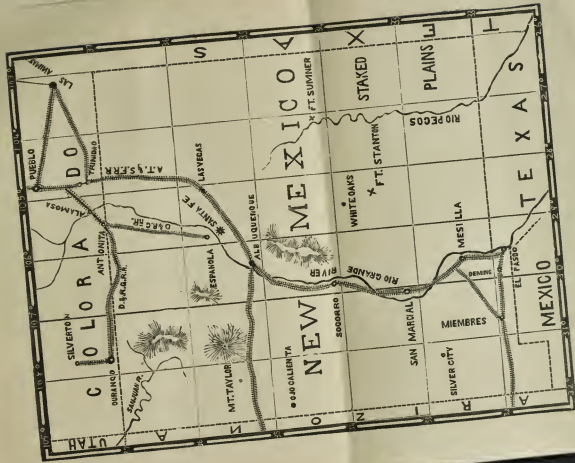
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The other is the Star Line Mail and Transportation company, running to Prescott, Arizona. The fare between Santa Fe and Prescott is \$75, and for less distances fifteen cents per mile. The distance to Prescott is five hundred and seven miles, and the distance from Santa Fe to intervening stations and between the stations is shown in the following table:

MILES.		MILES.	
Pena Blanca.....	27 ...	St. Joseph.....	15 314
San Isidro.....	27 54	Canvas Store.....	14 328
Cabazon Station.....	22 76	Brigham City.....	13 341
Willow Springs.....	28 104	Rock Station.....	14 355
San Mateo.....	16 120	Chaves' Pass	25 380
San Antonio Springs..	27 157	Pine Springs.....	22 402
Bacon Springs.....	16 163	Oak Grove	19 421
Fort Wingate.....	13 176	Beaver Head.....	23 444
Peter's Station.....	35 211	Camp Verde.....	15 459
Buckeye	19 230	Copper Canon.....	8 467
Navajo Springs.....	23 253	Hilterbrand's Station..	24 491
Carrizo Creek.....	24 277	Prescott, A. T.....	16 507
Horse Head Crossing..	22 299

Passengers are allowed forty pounds of baggage, and, for all over that, eight cents per pound for each one hundred miles. The stages run five miles per hour, and the time through is ninety-six hours.

Passengers can, if they choose, go by the Atchison, Topeka and Santa Fe road to Albuquerque, and take the stage thence for Prescott, going via Ft. Wingate. By this route the distance is forty-seven miles less. From Prescott daily communication, by other stage lines, can be had with Phenix, Gillette, Maricopa, Florence, Globe, Mohave City, Tucson, the Tombstone mining district, and the San Carlos Indian reservation and agency.

STAGE LINES FROM ALBUQUERQUE.

There are two stage lines from Albuquerque, one for Prescott, already spoken of in the article on Santa Fe, and the National Mail and Transportation company of Tuscon. The

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time of the latter is a little over five days, the rate of travel five miles per hour, the fare fifteen cents per mile. The following table shows the distances between stations, and the distances from Albuquerque:

	MILES.		MILES.
Pajarito	9 ...	Las Cruces.....	17 232
Isleta	6 15	La Mesilla.....	3 235
Las Lunas.....	5 20	Slocum's ranch.....	25 260
Belen	12 32	Fort Cummings.....	20 280
Sabinal	23 55	Hot Springs.....	20 300
Socorro	27 82	Fort Bayard	41 341
San Antonio.....	10 92	Silver City.....	9 350
San Marcial.....	13 105	Burro Mountain.....	25 375
Fort Craig	7 112	Shakespeare.....	25 400
Paraje.....	8 120	Camp Bowie.....	61 461
Round Mountain....	23 143	Steel Station.....	25 486
Aleman	22 165	Point of Mountain....	12 498
Point of Rocks	20 185	Tres Alemas.....	35 533
Fort Selden	20 205	Willow Springs.....	20 553
Leesburg.....	5 210	Tucson.....	27 580
Dona Ana.....	5 215

Each passenger is allowed the usual forty pounds of baggage, and freight is eight cents per pound for every one hundred miles. At Mesilla the line connects for El Paso and other Texas points, and for Hillsboro and other points in Old Mexico. At Silver City connections are made for Globe City, Arizona; at Point of Rocks for Ft. Thomas and Ft. Grant, New Mexico; and at Tucson for Tombstone, Phenix, Florence and Arivaca, Arizona.

STAGE LINES TO WHITE OAKS.

You can go to White Oaks from either Las Vegas or Santa Fe. From the latter point the stations are as follows: Santa Fe to Galisteo, 23 miles; Galisteo to Antelope Springs, 40 miles; Antelope Springs to Pino's Alkali Wells, 30 miles; Wells to Jicarilla Station to, 40 miles; Jicarilla Station to White Oaks City, 13 miles; total, 146 miles.

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
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PUBLISHED WEEKLY

VOLUME 71, NUMBER 1, JANUARY 1951

Subscription price, \$5.00 per annum in advance. Single copies, 15 cents.

Published by the American Medical Association

535 North Dearborn Street, Chicago 10, Ill.

Second-class postage paid at Chicago, Ill., and at additional mailing offices.

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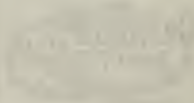
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